3.20 Recreation

3.20.1 Area of Analysis

The recreational setting within the Klamath Basin is characterized by an expansive rural landscape that offers a myriad of outdoor recreational opportunities. Within the basin, there are five national forests (Klamath, Fremont, Winema, Six Rivers, and Modoc), one joint national and state park (Redwood), one national park (Crater Lake), two national monuments (Lava Beds and Cascade - Siskiyou), five National Wildlife Refuges (NWRs) (Klamath Marsh, Tule Lake, Clear Lake, Upper Klamath, and Lower Klamath) that make up the Klamath Basin NWR System, 297 miles of Klamath River Wild and Scenic Rivers (WSR) (segments of the Klamath, Scott and Salmon Rivers and Wooley Creek analyzed as those WSR segments most likely to be affected by the proposed alternatives), and extensive public and private recreational opportunities along the Klamath River and its reservoirs. Federal and state agencies, including the United States Forest Service (USFS), Bureau of Land Management (BLM) (including the Northern California District, and Lakeview and Medford Districts in Oregon), United States Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG), are responsible for managing these lands which are located in Klamath and Jackson Counties, Oregon, and Siskiyou County, California. Figure 3.14-1 in Section 3.14, Land Use, Agriculture and Forest Resources, shows the management of lands in the Klamath Basin. The analysis of potential effects on WSR components are discussed in the following subsections and pages of this section:

- Scenic Quality - Section 3.20.4.3, pages 3.20-48 and 60
- Recreation – Section 3.20.4.3, pages 3.20-51 and 60
- Fisheries - Section 3.20.4.3, pages 3.20-53 and 60
- Wildlife - Section 3.20.4.3, pages 3.20-56 and 60

The area of analysis includes recreation areas and access along the Klamath River from its headwaters in Oregon to the mouth of the river at the Pacific Ocean. Recreational areas within and directly adjacent to the Klamath Basin are described to provide an overview of regional opportunities. Impacts on recreation opportunities as a result of the alternatives would be limited to those within the Klamath River corridor; therefore, the analysis focuses on those recreational facilities and opportunities adjacent to the Klamath River. Descriptions of recreational opportunities, activities, and settings are presented here by geographic location, including within the Klamath Basin, upstream of J.C. Boyle Reservoir, between J.C. Boyle Reservoir and Iron Gate Dam, and downstream of Iron Gate Dam. Section 3.20.4.3 presents an assessment of potential impacts of the alternatives, including the Proposed Action to remove J.C. Boyle, Copco 1, Copco 2, and Iron Gate Dams (the Four Facilities), on recreational resources.

3.20.2 Regulatory Framework

Recreation within the area of analysis are regulated by several federal, state, and local policies, which are listed below.

3.20.2.1 Federal Authorities and Regulations

- Wild and Scenic Rivers Act (WSRA) (16 U.S.C. 1271 et seq.)
- Federal Land Policy and Management Act (43 U.S.C. 1701 et seq.)
- U.S. Forest Service Six Rivers National Forest Land and Resource Management Plan
- U.S. Forest Service Fremont National Forest Land and Resource Management Plan
- U.S. Forest Service Klamath National Forest Land and Resource Management Plan
- National Park Service (NPS) General Management and Strategic Plan, Redwood National Park
- Federal Endangered Species Act (ESA)

3.20.2.2 State Authorities and Regulations

- California Wild and Scenic Rivers Act
- Oregon Parks and Recreation Department, Klamath River Scenic Waterway Rules

3.20.2.3 Local Authorities and Regulations

- City of Klamath Falls Parks Recreation and Open Space Master Plan

3.20.3 Existing Conditions/Affected Environment

3.20.3.1 Regional Opportunities

Rivers, streams, and lakes are common throughout the mountainous landscape, and grasslands exist in the high plateau areas of the region. A large number of public lands are in the region, including five national forests, five NWRs, one national park, one joint national and state park, and two national monuments. These areas provide sightseeing, camping, hiking, fishing, wildlife viewing, and other recreational opportunities (Figure 3.20-1). In addition, a number of the lands have rivers or river segments designated as WSRs. Table 3.20-1 provides a summary of the opportunities offered on public lands within and adjacent to the Klamath Basin.

River-Based Recreation

A number of rivers cross the region, including four rivers with segments in the Klamath Basin designated as Wild and Scenic under Section 7 of the WSRA (Sprague River, Sycan River, Smith River, and Trinity River), as well as portions of the Klamath River (described above), designated as Wild and Scenic under Section 2(a)ii of the WSRA. Other rivers in the Klamath Basin, as shown on Figure 3.20-1 include the Salmon River, Scott River, and Clear Creek. These rivers provide a variety of recreational opportunities, including sightseeing, fishing, and whitewater boating. Figure 3.20-1 shows the location of these rivers relative to the Klamath River. Table 3.20-2 provides a summary of the rivers, the fish species caught, and the typical types of fishing methods (e.g., boat, bank, fly). Table 3.20-3 summarizes the whitewater boating opportunities in the region. The Oregon WSRs, in particular, have outstanding recreational and/or scenic values along the

length of the designated segments. The California WSRs are classified as wild, scenic, and recreational along the length of the designated segments (National Wild and Scenic Rivers 2011).

Reservoir-Based Recreation

Numerous opportunities for reservoir and lake-based recreation are available in the vicinity of the Proposed Action area. Table 3.20-4 provides a summary of the lakes and reservoirs in the region, including facilities and use levels. Among Klamath County and Jackson County, Oregon and Siskiyou County, California, there are more than 85 boatable lakes, containing nearly 40 boat ramps (Boat Escape website 2002). The area also has more than 180 high-elevation and wilderness lakes in Siskiyou County (Federal Energy Regulatory Commission [FERC] 2007). In addition to boat ramps, these lakes provide nearly 2,300 developed campsites within less than a two-hour drive from the subject reservoirs. Some reservoirs in the region are also stocked with trout or warm water fish such as perch or bass Angling occurs at the many lakes and reservoirs in the region and many are known for having excellent fisheries.

Federal- and State-Managed National Forests, Public Lands, and Parks

Klamath National Forest

The Klamath National Forest consists of about 1.7 million acres, and the 300 miles of rivers within the forest include 202 miles of designated WSR segments (see Section 3.20.3.5). The Klamath River flows for 107 miles through the Klamath National Forest west of Interstate 5 (I-5) to the National Forest's border at Ishi Pishi Falls. The Klamath National Forest provides uncrowded, high quality opportunities for sightseeing, fishing, wildlife viewing, whitewater and flatwater boating, hiking and horseback riding along 1,100 miles of trails, hunting, mountain biking, cross-country skiing, off-highway vehicle (OHV) and snowmobile use, mountain climbing, and spelunking. There are 34 developed campgrounds within the forest, and dispersed day and overnight use occurs in various locations throughout the forest (FERC 2007; U.S. Department of Agriculture [USDA] 2010).

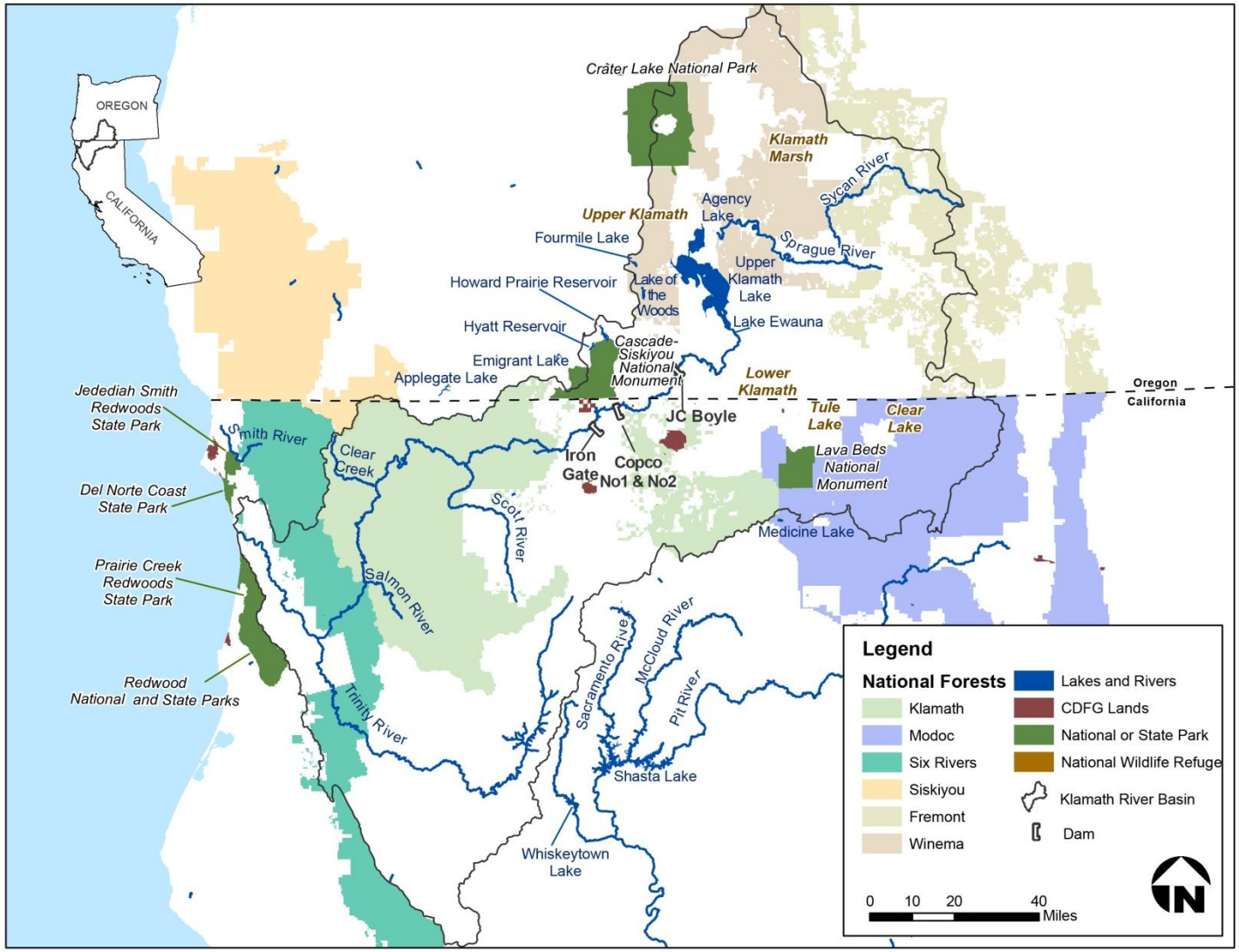

Figure 3.20-1. Regional Recreation Areas

Table 3.20-1. Public Lands Offering Recreational Opportunities in the Vicinity of the Klamath River

Name	Size	No. of Campgrounds	Recreational Activities Available										
			Sightseeing	Hiking	Picnic Areas	Fishing	Boating	OHV	Wildlife viewing	Skiing	Rock climbing	Mountain biking	Snow play	Other
Klamath National Forest	1.7 million acres	28	X	X		X	X	X	X	X	X	X	X	hunting, equestrian use, spelunking, golf
Fremont National Forest	1.2 million acres	1	X	X		X				X		X		hunting, equestrian use, backpacking, leisure driving
Winema National Forest	1.1 million acres	6	X	X	X	X	X			X			X	backpacking, snowmobiling
Six Rivers National Forest	1 million acres	5	X	X		X	X		X					hunting, backpacking
Lava Beds National Monument	46,500 acres	1	X	X					X			X		caving
Crater Lake National Park	183,000 acres	2	X	X						X		X		swimming, snowshoeing, snow camping
Klamath Marsh NWR	40,600 acres	0	X						X					waterfowl hunting, photography
Lower Klamath NWR	53,600 acres	0	X						X					waterfowl hunting, photography, automobile touring
Upper Klamath NWR	14,900 acres	0	X		X		X		X					waterfowl hunting, photography

Table 3.20-1. Public Lands Offering Recreational Opportunities in the Vicinity of the Klamath River

Name	Size	No. of Campgrounds	Recreational Activities Available											
			Sightseeing	Hiking	Picnic Areas	Fishing	Boating	OHV	Wildlife viewing	Skiing	Rock climbing	Mountain biking	Snow play	Other
Redwood National and State Parks	133,000 acres	4	X	X	X	**X**	**X**		**X**			X		backpacking, equestrian trails, scenic drives
BLM - Cascade-Siskiyou National Monument	53,000 acres	3	X	X		X	X		X	X	X	X		snowmobiling, equestrian use, hunting
BLM - Klamath Falls Resource Area	215,000 acres	5	X	X	X	X	X	X	X				X	rafting, swimming, snowmobiling

Key:
OHV: off-highway vehicle
NWR: National Wildlife Refuge
BLM: Bureau of Land Management

Table 3.20-2 Rivers Providing Recreational Fishing Opportunities in the Region

River	Fish Species Caught[1]	Common Types of Fishing
McCloud River	Native trout	Fly fishing, bank fishing
Pit River	Native trout; brown trout; smallmouth bass; rough fish	Fly fishing, bank fishing
Rogue River	Chinook salmon, steelhead	Drift boat, powerboat, fly fishing
Salmon River	Chinook salmon, steelhead, resident trout	Fly fishing, bank fishing
Scott River	Chinook salmon, steelhead, resident trout	Fly fishing, bank fishing
Smith River	Chinook salmon, steelhead	Drift boat, powerboat, fly fishing, bank fishing
Trinity River	Chinook salmon, steelhead, sturgeon, American shad, lamprey	Drift boat, powerboat, fly fishing, bank fishing
Upper Sacramento	Chinook salmon, native and stocked trout, American shad	Fly fishing, bank fishing
Klamath River	Redband trout, salmon	Fly fishing, bank fishing, drift boat

Source: Federal Energy Regulatory Commission 2007

Note:

[1] Information is based on species caught within the 2003-2004 time period.

Table 3.20-3 Rivers with Whitewater Boating Opportunities in the Region

River	Generalized Use Levels	Boating Class Type[1]	Miles of Boatable Whitewater	Factors Affecting Use Levels
Clear Creek	Low	III-V	7	Difficult access
Klamath River (above CA/OR state line)	Moderate	III-IV+	31	Remote, not suited for beginner or intermediate boaters, unless accompanied by a commercial outfitter
Klamath River (downstream of Iron Gate Dam)	Moderate	II-V	122	Most skill levels, easy access, 186 miles support multi-day floats, shoreline camping, scenery, many outfitters, commercial use
North Umpqua River	Moderate	II-IV	32	Easy access, most skill levels, scenery, boatable year round, shoreline suitable for camping
McCloud River	Moderate	II-IV	35	Proximity to I-5, most skill levels, low flows in summer
Pit River	Low	IV-V	34	Fragmented/short runs with long stretches of flatwater between, remote location
Rogue River	High	II-V	100+	Easy access, most skill levels, scenery, boatable year round, shoreline suitable for camping, many commercial outfitters
Salmon River	Moderate	II-V	44	Requires advanced/expert boating skills, commercial use
Scott River	Low	III-V	20	Recommended for expert boaters only
Smith River	Low	II-V	100+	Requires advanced/expert boating skills, low summer flows
Upper Sacramento River	Low	III-V	36	Proximity to I-5, average solitude
Trinity River	Moderate	II-V	100+	Most skill levels, easy access, commercial use

Source: FERC 2007

Note:

[1] As rated by the American Whitewater International Scale of Difficulty (American Whitewater 1998).

Table 3.20-4. Comparison of Subject Reservoirs with Lakes and Reservoirs in the Region

Lake or Reservoir	Distance from Nearest Subject Reservoir (mi)	Surface Water (acres)	Number of Developed Campsites	Number of Developed/ Improved Boat Launches	Number of Developed Picnic Areas	Generalized Use Levels
Subject Reservoirs						
J.C. Boyle	N/A	420	16	2	4	Low
Copco 1	N/A	1,000	0	2	2	Low
Copco 2	N/A	40	0	0	0	Low
Iron Gate	N/A	944	37	3	6	Moderate
Other Lakes and Reservoirs in the Region						
Hyatt Reservoir	15	1,250	172	2	1	Moderate
Emigrant Lake	16	806	110	2	2	Moderate
Howard Prairie Reservoir	17	2,000	303	4	1	Moderate
Upper Klamath Lake	20	85,120	269	6	1	Moderate
Lake of the Woods	21	1,113	190	3	1	High
Fourmile Lake	26	740	25	1	0	Low
Agency Lake	28	5,500	43	3	0	Low
Applegate Reservoir	36	988	66	3	1	Low
Medicine Lake	46	408	72	1	1	Low
Gerber Reservoir	62	3,830	50	2	1	Moderate
Trinity Lake Unit	73	16,535	500	7	2	Moderate
Whiskeytown Lake	87	3,200	139	3	1	Moderate
Shasta Lake	87	29,500	320	7	7	High
Lost Creek Reservoir	178	3,430	202	1	2	N/A
Willow Lake	31	927	66	7	8	N/A
Willow Valley Reservoir	69	200	1	1	1	N/A
Lake Siskiyou	46	160	1			N/A
Juanita Reservoir	14	55	23	2		N/A
McCloud Reservoir	58	520	6	1	1	N/A

Source: PacifiCorp 2004; Jackson County Parks 2010; VisitUsa.com 2010.
Key:
mi: miles
N/A: not available

Six Rivers National Forest

Six Rivers National Forest encompasses more than 1 million acres of land located east of the redwood belt of northwestern California and the Hoopa Valley and Yurok Indian Reservations, and extends from the Oregon border south through Del Norte, Siskiyou, Humboldt, and Trinity Counties. The Klamath River runs for 20 miles through the Six Rivers National Forest west of Ishi Pishi Falls to the boundary of Hoopa Tribal lands. Recreational opportunities in the Six Rivers National Forest include 24 developed campgrounds, 400 miles of trails for hiking and sightseeing along 365 miles of designated WSRs, backpacking, whitewater boating on 100 miles of the Smith River and approximately 50 miles of the Trinity River, and world-class salmon and steelhead fishing and hunting opportunities. The Six Rivers National Forest is also home to many rare and endangered plants and flowers that are attractive for botanical tours (USDA 2009).

Redwood National and State Parks

Redwood National Park is one of four park units jointly managed as Redwood National and State Parks under a cooperative management agreement between the NPS and the California Department of Parks and Recreation (California State Parks). Together with three state parks-Prairie Creek Redwoods, Del Norte Coast Redwoods, and Jedediah Smith Redwoods State Parks-the parks encompass 133,000 acres. These parks preserve the largest remaining sections of ancient coast redwood forest, including some of the world's tallest and oldest trees and provide forest and stream habitat for threatened and endangered birds and salmonids (NPS 2005). Recreational opportunities include four developed campgrounds, hiking, backpacking, horseback riding, scenic drives, visitor centers, and ranger-led programs designed to inform and inspire the public on this unique ecosystem (NPS 2009).

Fremont-Winema National Forest

The Fremont-Winema National Forest is located in south-central Oregon on the eastern slopes of the Cascade Mountain range. The combined forest area consists of 2.3 million acres. The lowest elevations of the forest adjoin Upper Klamath Lake where there are marshes, lakes, forested slopes, and wide basins. There are 22 developed campgrounds and 9 day-use areas across the forest. Recreational opportunities include sightseeing, fishing, wildlife viewing, hiking, downhill skiing, and hang gliding (FERC 2007).

Modoc National Forest

The Modoc National Forest is located along the California-Oregon State Line and is the most northeasterly of the national forest units in the Pacific Southwest Region. The forest area consists of approximately 2 million acres. The Modoc National Forest does not draw as large a volume of recreational travel compared to other forests closer to population centers, with the exception of the one-month open deer season which is known to attract as many as 10,000 hunters. Other recreational opportunities include fishing, camping, hiking, and sightseeing (USFS 2011).

BLM Klamath Falls Resource Area

Located in the BLM Lakeview District, the BLM-administered lands of the Klamath Falls Resource Area are in southern Klamath County on the eastern slope of the Cascade Range. In addition to BLM-administered land (212,000 acres), there are 21,000 acres of non-federally-owned surface land underlain by subsurface federal mineral estate within the Resource Area that are also administered by the BLM (BLM 1995). The two main recreation areas located in the Klamath Falls Resource Area include the Klamath WSR and the Wood River Wetland (BLM 2011a). The Klamath WSR area is located 30 miles southwest of Klamath Falls. While travel is limited to rough gravel roads and jeep trails, the area is utilized for wildlife viewing, hunting, fishing, biking, hiking, and camping, among other recreational activities (BLM 2011a). The Klamath Falls Resource Area Management Plan (BLM 1995) lists 15 developed and semi-developed recreation sites including day-use and campsites, and four developed trails. The Wood River Wetland area is open to the public year-round for day-use only, and includes paved parking, a trail, a canoe launch, picnic areas, toilets, and interpretive signs (BLM 2011a). Recreational activities that take place at the Wood River Wetland area include wildlife viewing, botanical sightseeing, hunting, fishing, canoeing, hiking, and biking (BLM 2011a).

Cascade-Siskiyou National Monument

Located in the BLM Medford District, the Cascade-Siskiyou National Monument was designated a national monument by presidential proclamation in 2000. The national monument is located where the Cascade, Klamath and Siskiyou mountain ranges converge and consists of 54,000 acres of BLM-administered lands (BLM 2011b). The area is recognized for its remarkable biological diversity and varied landscape, as well as important archaeological and historical resources. The Hyatt Lake Recreational Area is the only developed recreational site within the monument and includes many developed campgrounds (BLM 2008). The major recreational activities within the monument include camping, hiking, horseback riding, sightseeing, hunting, fishing, cross-country skiing, snowmobiling, rock climbing, and nature study (BLM 2008). The majority of the monument is undeveloped and visitor use is estimated as light to moderate throughout. The Hyatt Lake Recreational Area receives moderate use during April through October. In 2003, records show that over 14,000 people visited the recreational area (BLM 2008).

3.20.3.2 Recreation Opportunities along the Klamath River Segment Upstream of J.C. Boyle Reservoir

Recreation Facilities and Opportunities

Upstream of J.C. Boyle Reservoir, a small number of developed recreational facilities exist. The following paragraphs provide brief descriptions of each facility and the recreational opportunities available.

Agency Lake is connected to the northern arm of Upper Klamath Lake. Although Agency Lake has no marina, there are two public boat launches and it has a fishery that features trophy redband trout. Other popular recreational activities at the lake are sightseeing, including wildlife viewing of waterfowl, otter, mink, deer, and bald eagles (and waterfowl hunting) (Southern Oregon Directory and Guide 2010). As shown in Table 3.20-4 above, a number of campgrounds surround the lake.

Upper Klamath Lake is the largest freshwater body of water in Oregon. In the northern portion of the lake, Pelican Bay is known for its population of redband trout and is an extremely popular destination for fly-fishing. The bay is also a popular location for canoeing and kayaking, as well as sightseeing and wildlife viewing. Other popular activities in Upper Klamath Lake include sailing and waterfowl hunting. As shown in Table 3.20-4 above, there are numerous campgrounds and boat launches surrounding the lake.

The Link River segment of the Klamath River, an approximately 1-mile stretch downstream from Link River Dam, has only one developed recreational facility, the Link River Nature Trail. This 1.4-mile trail is for pedestrian use only and follows a gated access road on the west side of the Link River Bypass Reach. The Link River Nature Trail is popular for sightseeing, hiking, walking, jogging, trout fishing, and bird watching (FERC 2007).

The Keno Impoundment/Lake Ewuana provides various recreational opportunities, including fishing, picnicking, boating, camping, sightseeing, and wildlife viewing. In the fall, waterfowl hunting is a popular activity at Keno Impoundment/Lake Ewuana. Although most of the land adjacent to the reservoir is privately owned, Lake Ewauna has several public access areas, including the City of Klamath Falls Veterans' Memorial Park/Boat Launch, Miller Island Boat Launch, the Klamath Wildlife Viewing Area, and the Keno Recreation Area and Campground (PacifiCorp 2004). Table 3.20-5 provides a summary of the facilities and estimated annual visitation and capacity as assessed by PacifiCorp as part of relicensing studies for the Klamath Hydroelectric Project (KHP) (PacifiCorp 2004).

Table 3.20-5. Keno Impoundment/Lake Ewauna Developed Recreation Facilities

Site Name	Facilities	2001/2002 Est. Annual Use (Recreation Days[1,2])	Est. Facility Use vs. Capacity
Klamath Falls Veterans' Memorial Park/Boat Launch	Boat launch, day use area	42,500	Exceeding capacity
Miller Island Boat Launch and Klamath Wildlife Viewing Area	Boat launch, wildlife viewing trail, and a portable toilet	7,300	Approaching capacity
Keno Recreation Area and Campground	Campsites (26), day use area, restrooms, boat launch and boarding dock	6,000	Below capacity

Source: PacifiCorp 2004; FERC 2007.

Notes:

[1] Recreation days are defined as one visitor to a recreation area for any reason in a 24-hour period.

[2] Data for PacifiCorp Reservoir use was collected by PacifiCorp in 2001 and 2002. No more recently collected data exists or is available.

The Klamath Falls Veterans' Memorial Park provides a boathouse and boat launch ramp on the northern shoreline of Keno Impoundment/Lake Ewuana and is managed by the City of Klamath Falls, Department of Parks and Recreation. Along the northwestern end of the lake, the Klamath Wingwatchers Lake Ewauna Nature Trail provides opportunities for bird watching and hiking. This 1.8-mile trail connects Veterans' Memorial Park to the Link River trail, along the Link River to the north. Another trail is currently under construction on the northeastern side of the lake (Klamath Birding Trails 2010).

The Miller Island Boat Launch is on the east shore of Keno Impoundment/Lake Ewuana about 6 miles south of Klamath Falls, and is managed by the Oregon Department of Fish and Wildlife. The facility is accessed by Miller Island Road, which runs three miles through the Klamath Wildlife Area and Miller Unit, which provides an entrance station area, parking area, wildlife viewing trail, and a portable toilet. The Keno Recreation Area and Campground on the southwestern shore of the Keno Impoundment/Lake Ewuana provides a campground, day use area, and boat launch. The campground has 26 developed campsites, restrooms, and a recreational vehicle (RV) dump station. Recreational opportunities in this area include camping, fishing, picnicking, sightseeing, and boating. The Keno Recreation Area consists of upper and lower use areas, with the upper area adjacent to the campground and the lower area adjacent to the boat launch (FERC 2007).

Whitewater Boating Opportunities

The Klamath River downstream of Link River Dam provides approximately one mile of river suitable for whitewater boating and other river-based activities. Recreational studies of this reach have not detected whitewater boating use; however, there are anecdotal accounts of boating use occurring in the reach (FERC 2007). There is one short Class III/IV rapid and one Class II/III ledge drop in this segment of the river.

The Klamath River downstream of Keno Dam provides approximately five miles of river suitable for whitewater boating, although not much boating use is reported for this reach, perhaps due to its level of access and short run length. The reach is rated Class III difficulty, and flows acceptable for whitewater boating opportunities range from 1,000 to 4,000 cubic feet per section (cfs). Table 3.20-6 provides a summary of acceptable flow ranges for whitewater boating and other flow-dependent recreational activities in the Klamath River (from the Keno Reach to the ocean).

Fishing Opportunities

Fishing is allowed from September 30 until June 16 on the Klamath River downstream of Link River Dam. The highest use in this area occurs from late winter through spring; this area is mainly used by City of Klamath Falls local residents. At lower flow times, anglers use the river at a few sites where there is access for bank fishing through thick riparian vegetation. Catch records indicate that although angler success is consistently low, there is a greater percentage of larger fish caught in this reach than between J.C. Boyle Dam and the state line. Table 3.20-6 below summarizes flows acceptable for fishing opportunities in the various reaches of the Klamath River.

Table 3.20-6. Acceptable Flow Ranges for Various River-Based Activities for Reaches of the Klamath River

River Reach (Length of Reach)	Activity	Low Value (cfs)[1]	High Value (cfs)[1]
Keno Reach (5.0 miles)	Whitewater Boating – Standard	1,000	4,000
	Play Boating	1,100	1,800
	Fishing	200	1,500
J.C. Boyle Bypass Reach (4.3 miles)	Whitewater Boating – Standard	1,300	1,800
	Fishing	200	1,000
Hell's Corner Reach (16.4 miles)	Whitewater Boating/Rafting[2]	1,300	3,500
	Fishing[3]	200	1,500
Copco 2 Bypass Reach (1.3 miles)	Whitewater Boating	600	1,500
	Fishing	50	600
Iron Gate to Scott River (47 miles)	Whitewater Boating/Fishing	800	4,000
Scott River to Salmon River (76 miles)	Boating	800	7,000
	Fishing	800	4,000
Salmon River to Trinity River (23.1 miles)	Whitewater Boating/Fishing	800	10,000
Trinity River to Ocean (43.4 miles)	Whitewater Boating/Fishing	1,800	18,000

Source: Recreation Sub-Team 2010 (See Appendix R of this EIS/EIR); PacifiCorp 2004; FERC 2007.

Notes:

[1] Values were determined by the recreation sub-team (2010) from relicensing documents (PacifiCorp 2004; FERC 2007) and consultation with USFS and BLM representatives.

[2] Flows are within the desirable range during the daily peak hydroelectric operations period (between 10:00 AM and 2:00 PM).

[3] Flows are within the desirable range for at least 4 hours during the daily non-peak hydroelectric operations period (either between 5 AM and 11 AM or between 3 PM and 9 PM).

Key:
cfs: cubic feet per second

3.20.3.3 Recreation Opportunities in the Klamath River Segment Between J.C. Boyle Reservoir and Iron Gate Dam

Recreation Facilities and Opportunities

The subject dams impound four water bodies on the Klamath River: J.C. Boyle, Copco 1, Copco 2, and Iron Gate Reservoirs. In addition to these reservoirs, there is a stretch of unimpounded river between J.C. Boyle Reservoir and Copco Reservoir. Figures 3.20-2(a), (b), and (c) show the locations of these reservoirs, and the following sections describe recreational opportunities at each of these areas.

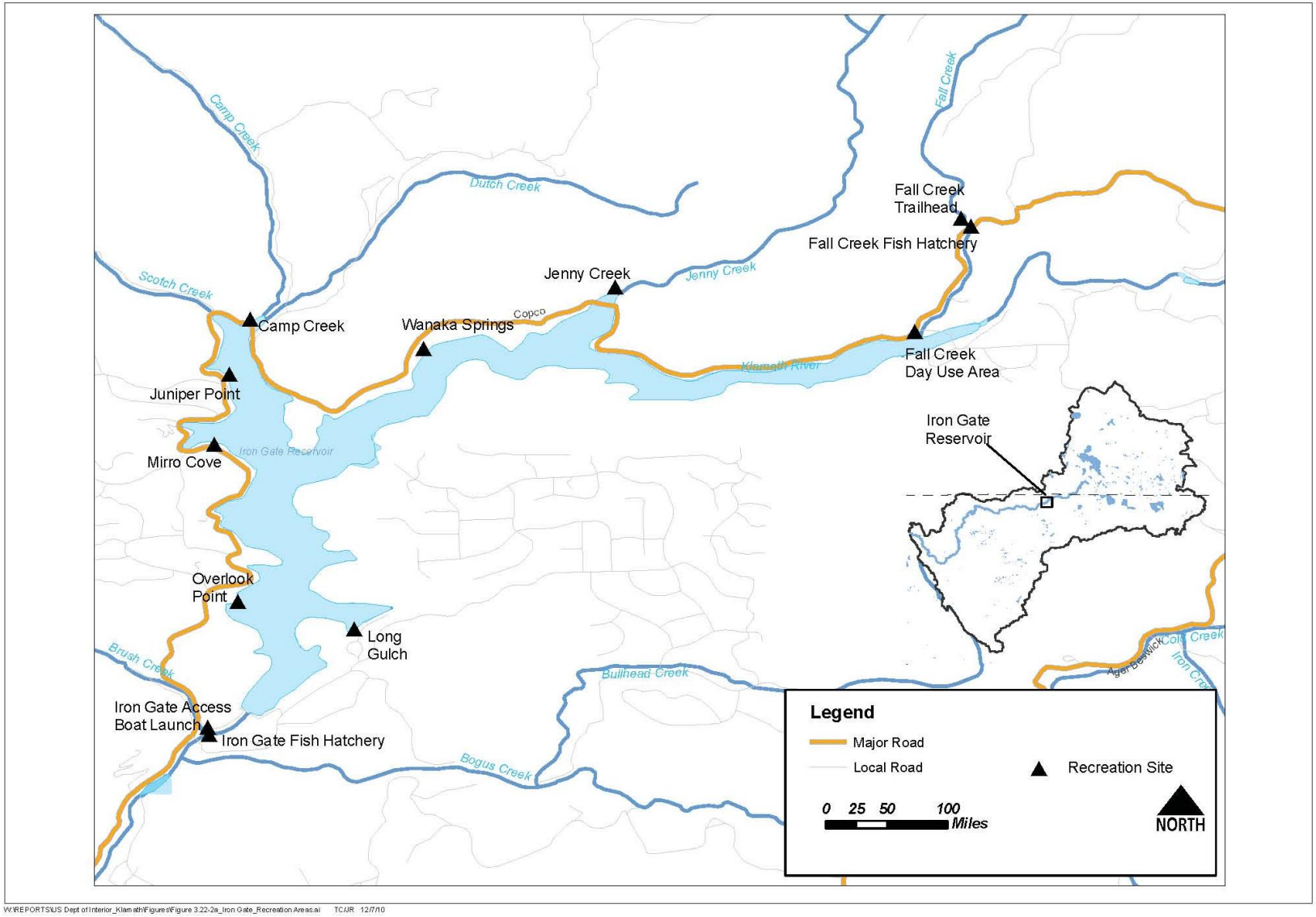

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Figure 3.20-2a. Iron Gate Recreation Areas

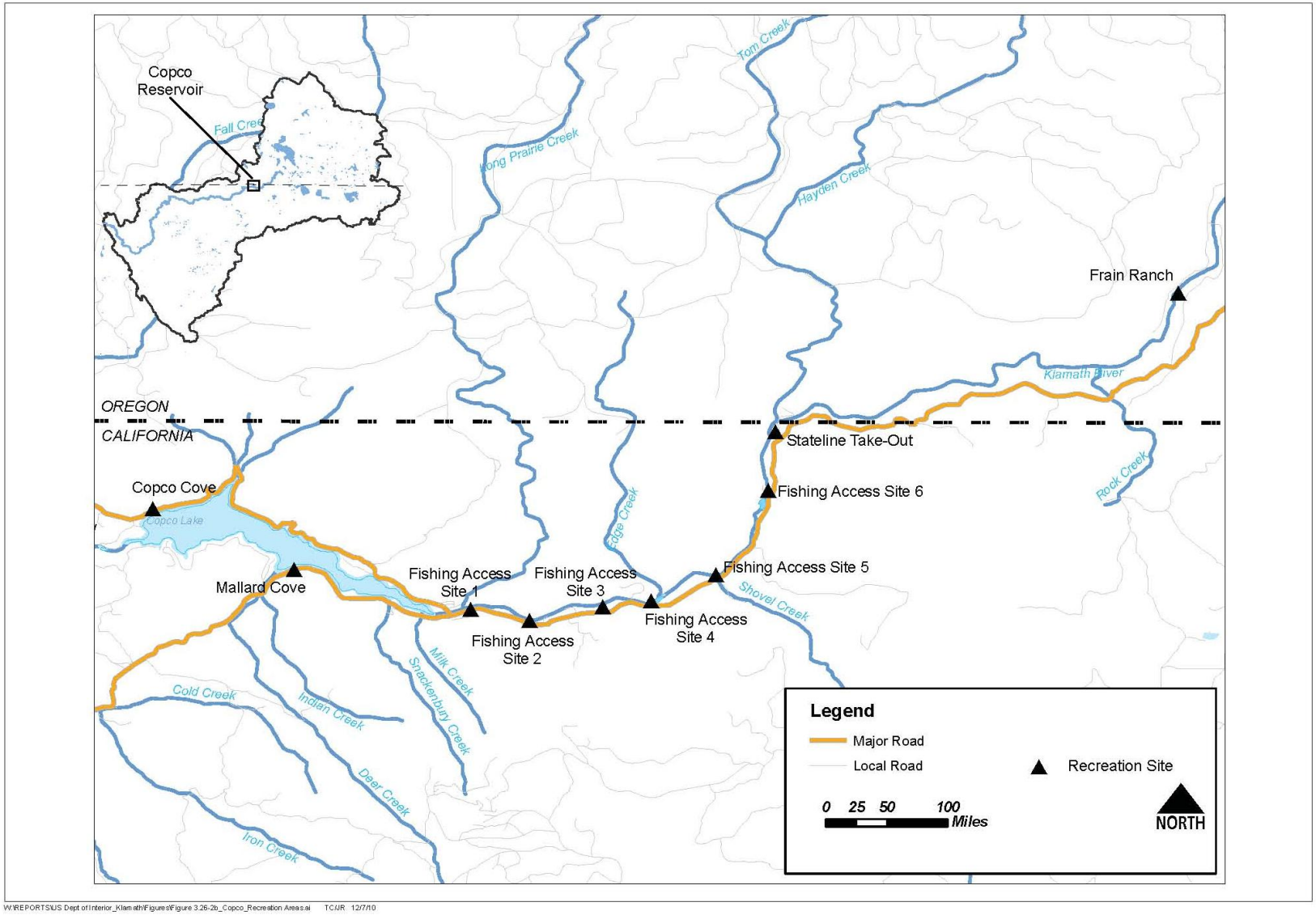

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Figure 3.20-2b. Copco Recreation Areas

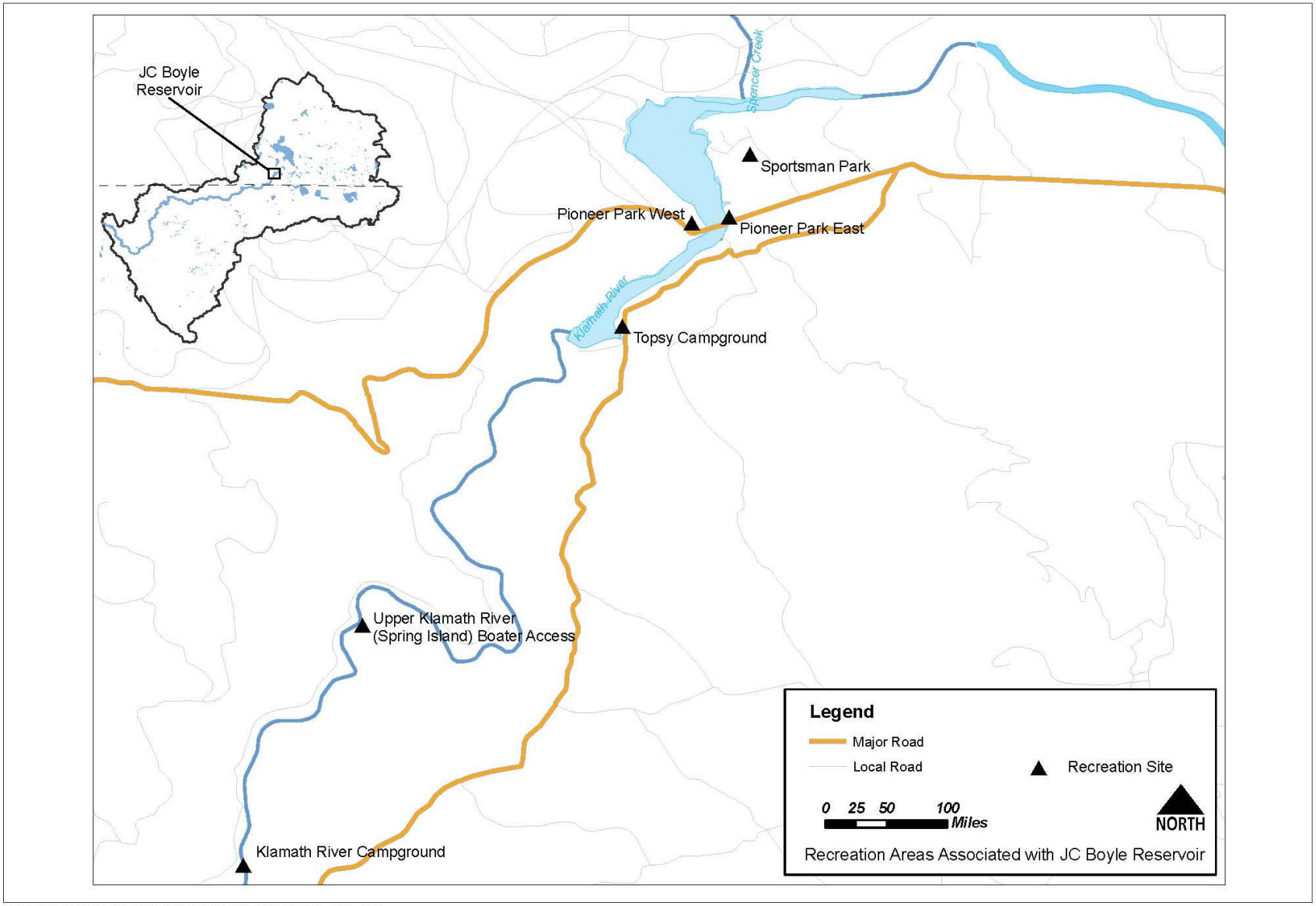

Figure 3.20-2c. J.C. Boyle Recreation Areas

J.C. Boyle Reservoir

J.C. Boyle Reservoir encompasses about 420 surface acres and is about 3.6 miles long. Developed public recreational facilities at the reservoir include Pioneer Park, Sportsman's Park, and Topsy Campground (Table 3.20-7).

Table 3.20-7. J.C. Boyle Reservoir Developed Recreation Facilities

Site Name	Ownership	Facilities	2001/2002 Est. Annual Use	Est. Facility Use vs. Capacity
Pioneer Park	PacifiCorp	Picnic areas, boat launches, interpretive signs, restrooms	16,700	Below capacity
Topsy Campground	BLM	Campsites (16), an RV dump, two day use areas, a boat launch with boarding dock, an accessible fishing pier, restrooms	5,600	Below capacity
Sportsman's Park	Klamath County	Shooting ranges, dirt racetracks, archery courses, a model aircraft flying field, OHV area, restrooms	12,600	Below capacity

Source: PacifiCorp 2004; FERC 2007.

Pioneer Park is owned and operated by PacifiCorp and it lies off Oregon State Highway 66 (State Highway 66) east and west of Spencer Bridge. Pioneer Park is a day use area that provides picnic areas, boat launches, interpretive signs, and two restroom facilities. It has an improved boat ramp on the east shore just off State Highway 66, and a picnic area and unimproved boat launch on the west shore. Popular activities at this location include sightseeing, boating, fishing, swimming, and picnicking (PacifiCorp 2004).

Topsy Campground is owned and managed by BLM. The campground is south of State Highway 66 off Topsy Grade Road, a gravel road maintained on an as-needed basis by BLM, private owners, timber companies, and PacifiCorp. This site features a campground with 16 sites, an RV dump, two day use areas, a boat launch with boarding dock, an accessible fishing pier, and two restroom facilities. The campground is available to the public and BLM charges fees for day use and camping at this facility (PacifiCorp 2004).

Sportsman's Park, approximately 0.25 mile east of the reservoir, is a multi-use recreation area owned by Klamath County and leased long-term to Klamath Sportsman's Park Association. The facility does not provide developed reservoir access, but does provide river access for fishing. The park contains shooting ranges, dirt racetracks, archery courses, and a model aircraft flying field. The park also has facilities for self-contained RVs and some tent camping. Annual membership passes and single-day passes for use of the park are available to the general public for a fee (PacifiCorp 2004; Klamath Sportsman's Park 2010).

Hell's Corner Reach

The Hell's Corner Reach of the Klamath River from J.C. Boyle Reservoir to Copco Reservoir extends about 16.4 river miles. Several public fishing and boat access areas exist along this reach, as summarized in Table 3.20-8.

Table 3.20-8. Hell's Corner Reach Developed Recreation Facilities

Site Name	Facilities	2001/2002 Est. Annual Use (Recreation days)	Est. Facility Use vs. Capacity
Spring Island Boater Access	Launch area, shoreline fishing access, restrooms	5,200	Below capacity
Klamath River Campground	Campsites (3), shoreline fishing and boating access, restrooms	1,000	Below capacity
Stateline Take-out	Boat put- in/take-out, shoreline fishing access, restrooms	2,700	Approaching capacity
Fishing Access Sites1-6	Shoreline fishing access, parking	3,600	Below capacity

Source: PacifiCorp 2004; FERC 2007.

The Spring Island boater access is adjacent to (downstream of) the J.C. Boyle Powerhouse and is managed by BLM. This site provides car-top whitewater boat launching and shoreline fishing access. The Klamath River Campground, managed by BLM, is about three miles downstream of the J.C. Boyle Powerhouse. The campground has three developed campsites and the shoreline which can be used for fishing and boater access. The state line take-out access area, at the Oregon/California state line, includes upper and lower areas and is co-managed by BLM and PacifiCorp. The facility provides shoreline fishing and boat launching access. The fishing access sites provide access to the Klamath River in six locations between the stateline take-out access area and Copco Reservoir.

Copco 1 Reservoir

Copco 1 Reservoir, which covers about 1,000 water surface acres and is about 4.5 miles long, has two publicly available day use facilities: Mallard Cove and Copco Cove. These facilities provide day use access, and although they are not official campgrounds, camping occasionally occurs at both locations. Table 3.20-9 summarizes the facilities and estimated use during 2001/2002 at both of these areas.

Table 3.20-9. Copco 1 Reservoir Developed Recreation Facilities

Site Name	Facilities	2001/2002 Est. Annual Use[1]	Est. Facility Use vs. Capacity
Mallard Cove	Picnic area, restrooms, boat launch with boarding dock	7,600	Below capacity
Copco Cove	Picnic area, restrooms, boat launch with boarding dock	1,250	Below capacity

Source: PacifiCorp 2004; FERC 2007.

Note:

[1] Recreation days are defined as one visitor to a recreation area for any reason in a 24-hour period. Estimated use was during the 2001/2002 study period (PacifiCorp 2004).

Mallard Cove, on the south shore of Copco Reservoir, is accessed off Ager-Beswick Road and includes day use facilities, two restrooms, and a boat launch with boarding dock. Copco Cove, on the western shoreline of Copco Reservoir, off of Copco Road, has a small picnic area, two restrooms, and a boat launch with boarding dock (PacifiCorp 2004).

Copco 2 Reservoir

Copco 2 Reservoir is relatively small (approximately 40 water surface acres and about 0.3 miles long) and has a narrow configuration with steep and difficult shoreline access. Copco 2 Reservoir has no recreation facilities and no public access (FERC 2007).

Iron Gate Reservoir

Iron Gate Reservoir is approximately 944 water surface acres and 6.8 miles long. The reservoir has the highest concentration of recreation sites of all the developments associated with the PacifiCorp facilities. The developed facilities at Iron Gate Reservoir include a trail (Fall Creek Trail), five combination day use and campground areas (Jenny Creek, Camp Creek, Juniper Point, Mirror Cove, and Long Gulch), three day use areas (Fall Creek, Overlook Point, and Wanaka Springs), and a fish hatchery and associated day use area (Iron Gate). Recreational opportunities include sightseeing, swimming, fishing, boating, and day and overnight use. Summer and weekend use is quite high at the reservoir, due to the popularity of bass tournaments, waterskiing, and camping. Table 3.20-10 summarizes the facilities at these sites and PacifiCorp's estimated annual recreation visitation and capacity during the 2001/2002 study period.

Table 3.20-10. Iron Gate Reservoir Developed Recreation Facilities

Site Name	Facilities	2001/2002 Est. Annual Use (Recreation days)	Est. Facility Use vs. Capacity
Fall Creek Day Use Area and Fall Creek Trail	Picnic area, boat launch access, restrooms, hiking trail	4,150	Below capacity
Overlook Point	Restrooms	1,900	Below capacity
Wanaka Springs Day Use Area	Fishing dock, restrooms	4,150	Exceeding capacity
Jenny Creek Day Use Area and Campground	Campsites (6), restrooms	3,700	Approaching capacity
Camp Creek Day Use Area and Campground	Campsites (13), boat launch, boarding and fishing docks, swimming area, a RV dump station, sports field, interpretive display restrooms	15,250	Exceeding capacity
Juniper Point Day Use Area and Campground	Campsites (9), a fishing dock, restrooms	4,700	Exceeding capacity
Mirror Cove Day Use Area and Campground	Campsites (10), a boat launch, restroom	11,140	Exceeding capacity
Long Gulch Day Use Area and Campground	Picnic sites, boat launch, restrooms	5,200	Below capacity
Iron Gate Fish Hatchery	Picnic area, picnic shelter, visitor center/interpretive kiosk, restrooms, trail to river	2,200	Below capacity

Sources: PacifiCorp 2004; FERC 2007.

The Fall Creek Day Use Area is at the upper end of the reservoir and includes a picnic area, boat launch access, and restroom facilities. This small day use area is adjacent to the CDFG Fall Creek Fish Hatchery and provides access to Fall Creek Trail. Fall Creek Trail is a short (0.1 mile) trail located adjacent to the Fall Creek Fish Hatchery where visitors can hike up to Fall Creek Falls.

Wanaka Springs Day-Use Area provides picnic areas, a fishing dock, and restroom facilities, and some informal camping occurs in the area.

Overlook Point is on the west side of the reservoir, approximately 0.75 mile upstream from the dam. The facility has picnic sites on moderately steep topography, providing a good view of the reservoir and surrounding landscape.

Jenny Creek Day Use Area and Campground includes six sites and a restroom facility. Jenny Creek is on the north side of the reservoir and provides a creekside setting for picnicking and bank fishing.

Camp Creek is along a narrow reach on the north side of Iron Gate Reservoir. The surrounding hilly, semi-arid landscape and the reservoir provide pleasant views. Camp Creek has several campsites designed primarily for RV campers, with a large overflow RV camping area. Juniper Point Day Use Area and Campground has several picnic areas that are occasionally used as campsites, a fishing dock and restroom facilities.

Mirror Cove is a day use area and campground centrally located on the west side of the reservoir. The site offers several picnic sites that are occasionally used as campsites, a boat launch, and restroom facilities. This particular location is popular for group camping and is used extensively by local water-ski clubs. This boat launch is the nearest access to a competitive water-ski course placed in the western area of the reservoir.

Long Gulch Day Use Area and Campground is on the east side of the reservoir directly across from Overlook Point. Facilities at this location include picnic sites, restroom facilities, and a boat launch. Land along an adjacent ridge is occasionally used for dispersed camping and day use (PacifiCorp 2004).

Below Iron Gate Dam, the Iron Gate Fish Hatchery is operated by CDFG and includes a public day use area adjacent to the hatchery and an undeveloped boat launch across the river from the hatchery. The day use area includes a picnic area, a picnic shelter, visitor center/interpretive kiosk, restroom facilities, a trail to the river, and seasonal interpretive tours. Fishing is prohibited in this area, in addition to 3,500 feet downstream of the dam.

Visitor Use and Perception

PacifiCorp conducted a visitor survey in 2004 to assess recreational use and visitor perceptions of facilities associated with the Four Facilities, including the subject reservoirs. The majority of visitors surveyed (approximately 60 percent) were from Klamath County and Jackson County, Oregon. The remaining visitors were from California, approximately half of which came from Siskiyou County. When asked to indicate all activities participated in while visiting the subject reservoirs, more than half

of the visitors surveys included resting/relaxing as one of the activities. When surveyed on their perception of crowding at the reservoirs, the mean score of respondents was 3.2 (on a 9-point scale from 1 – not crowded to 9 – extremely crowded), indicating that visitors did not feel overly crowded while participating in recreation activities. Further, approximately 39 percent of respondents had changed their visits to the subject reservoirs from other lakes in the area to avoid crowding. When surveyed regarding management options of the reservoirs, survey respondents indicated opposition to the collection of user fees at either day use sites or facility campgrounds (PacifiCorp 2004).

In response to the survey question "Has water quality ever affected your visit to the Klamath River area?" approximately two-thirds of recreational users of the subject reservoirs had negative perceptions of water quality, commenting on its color, turbidity, and odor. The source of visitor concerns was primarily the brown, foamy water in free-flowing reaches and regular, extensive algae blooms that occur throughout the reservoirs. Visitors reported that the algae produces bad odors, fouls fishing lines, and reduces the area available for fishing, swimming, and wading (FERC 2007).

Whitewater Boating Opportunities

Whitewater boating opportunities are provided on the J.C. Boyle Bypass Reach, the Hell's Corner Reach, and the Copco 2 Bypass Reach. The J.C. Boyle Bypass Reach includes about 5 miles of the Klamath River downstream of J.C. Boyle Dam and upstream of the J.C. Boyle Powerhouse. This reach provides Class III to IV+ rapids, and acceptable whitewater boating flows range from 1,300 cfs to 1,800 cfs[1]; however, this reach is typically dewatered with only 100 to 300 cfs base flow. Therefore, the majority of the year there is almost no boating use on this stretch of the river.

BLM manages whitewater boating use in the Hell's Corner Reach, a 16.4-mile reach from below J.C. Boyle Reservoir to the Fishing Access Site 1 take-out (see Figure 3.20-2b). This reach provides Class III to IV+ rapids during daily peaking flows from the PacifiCorp hydropower operations (between 10AM and 2PM), and acceptable whitewater boating flows range from 1,300 cfs to 3,000 cfs. Outside of the daily peaking flows, flow rates within this reach do not meet the acceptable range to create or enhance whitewater boating opportunities.

The average estimated annual whitewater boating use from 1994 through 2009 on this reach was 4,414 recreation days, peaking in the mid-1990s at around 6,000 recreation days per year. Whitewater boating use occurs typically during April through October, with about 80 percent of the commercial rafting use occurring during July through September. Commercial boating use accounted for about 93 percent of the whitewater boating use on this reach (United States Department of the Interior [DOI] 2011a).

[1] 1,300 cfs was used as the bottom end of the range for acceptable whitewater boating flows because this amount of flow is necessary for whitewater boating by loaded rafts. Therefore, potential impacts measured against this range is representative of outfitted trips along these reaches. More boating days would be available for flows down to 1,000 cfs for smaller craft and highly-skilled amount of flow is necessary for whitewater boating by loaded rafts. Therefore, potential impacts measured against this range is representative of outfitted trips along these reaches. More boating days would be available for flows down to 1,000 cfs for smaller craft and highly-skilled.

Commercial boating use is allowed by permit only. There is a set commercial capacity of 10 outfitters or 200 clients per day on this reach. There is no limit for private boating capacity, although BLM has established 250 persons per day as the overall whitewater boating carrying capacity of the reach. Factors that constrain the carrying capacity of the reach are vehicle congestion at the take-out locations near Copco 1 Reservoir and the limited size and number of areas that are available to scout rapids (FERC 2007). Rafting use in this area, above Copco 1 Reservoir in particular, depends upon operation of the J.C. Boyle Powerhouse upstream (FERC 2007).

The Copco 2 Bypass Reach is approximately 1.3 miles long, extending from Copco 2 Dam to the Copco 2 Powerhouse and whitewater boating opportunities are limited due to lack of flow. However, the reach can provide Class IV whitewater opportunities and acceptable flows range from 600 to 1,400 cfs.

Fishing Opportunities

PacifiCorp conducted a visitor use survey in 2002 to obtain information on existing visitor demand, needs, and recreational activities within the area between J.C. Boyle Reservoir and Iron Gate Dam. The results of the survey indicated that 33 percent of visitors to the area participate in bank fishing, both along the river and reservoirs. Survey respondents also indicated that fishing for trout on river reaches in this area is considered very good, and the two most popular reaches for fishing opportunities are Keno Reach downstream of Keno Dam and J.C. Boyle Bypass Reach downstream of J.C. Boyle Dam. Further downstream, opportunities for trout fishing exist below J.C. Boyle Powerhouse (Hell's Corner Reach). This reach (between J.C. Boyle Powerhouse and the state line) is popular with anglers, and catch records indicate good angler success, although fish size is typically smaller than fish caught below Keno Dam and rarely exceeds 16 inches (FERC 2007).

Recreational opportunities downstream of Hell's Corner Reach, between the California/ Oregon state border and Iron Gate Dam, are also quite popular, especially for angling. In 1974, a 6-mile reach of the Klamath River, from the California/Oregon state line to Copco 1 Reservoir, was designated as Wild Trout water and is managed under the Wild Trout Program (CDFG 2010) (see also Section 3.3, Aquatic Resources). Demand for recreational angling is high in this area. The Klamath River between the Copco 1 and Iron Gate Developments has poor public access and no documented fishing activity.

3.20.3.4 Recreation Opportunities along the Klamath River Segment Downstream of Iron Gate Reservoir

Recreation Facilities and Opportunities

Most of the Klamath River corridor downstream of Iron Gate Dam flows through land managed by the USFS (Klamath National Forest and Six Rivers National Forest), although the river also crosses some county and city lands. Table 3.20-11 summarizes the river-based recreational opportunities available on the Klamath River downstream of Iron Gate Dam.

One privately developed recreation facility along the river is R Ranch, near Hornbrook. The R Ranch is a large private recreation complex used by RV campers and day users who are members of the R Ranch Landowners' Association. The R Ranch has two separate campgrounds. Cottonwood Campground is just off of I-5, farther away from the Klamath River and offers full RV hookup sites and an RV dump station. Klamath Campground is a few miles east of Cottonwood and I-5 and 2 miles downstream of Iron Gate Dam along 1.7 miles of the Lower Klamath River. This campground contains a large lodge and provides opportunities to fish, hunt and view natural scenery and wildlife.

Table 3.20-11. River-Based Recreation Opportunities below Iron Gate Dam

Reach	Length (miles)	Current Recreation Opportunities
Iron Gate Dam to Shasta River	13	Sightseeing, Fishing (especially from boats), tubing and swimming, whitewater boating (rare), waterplay
Shasta River to Scott River	34	Sightseeing, Fishing, canoeing, whitewater boating, locational playboating, waterplay
Scott River to Indian Creek	36	Sightseeing, Fishing, canoeing, whitewater boating, waterplay
Indian Creek to Salmon River	40	Sightseeing, Fishing, whitewater boating, canoeing, hiking, waterplay
Salmon River to Trinity River	40	Sightseeing, Fishing, waterplay

Source: PacifiCorp 2004.

There are also private land areas near the I-5 corridor, in Seiad Valley, at Happy Camp, and near the mouth of the Salmon River at Sommes Bar. In general, these areas have several homes and associated, sparsely populated, rural development. These areas have considerable opportunities to camp, swim, picnic, or relax along this portion of the river. There are also some opportunities for sightseeing, hiking, walking, or biking along the river. In addition, there are some popular short hikes from the river up the tributaries, such as Ukonom and Clear Creek. Land-based recreation points along the river are generally near developed access points for boaters and anglers and a few developed USFS and private campgrounds (PacifiCorp 2004). In addition, there are two National Scenic byways located along this segment of the river and within the Klamath and Six Rivers National Forests. The "State of Jefferson" National Forest Scenic Byway is located primarily on California State Highway 96 (State Highway 96) between Shasta River to Happy Camp, and the "Bigfoot" National Forest Scenic Byway is located on Highway 96 from Happy Camp to California State Highway 229 (State Highway 229). These byways provide excellent views for sightseers within the Klamath and Six Rivers National Forests and access to numerous other recreational activities (America's National Scenic Byways 2010). Downstream of the Trinity River confluence, the Klamath River flows through the Yurok, Hoopa and Resighini Indian Reservations and Redwood National Park, as well as some city and county lands. A number of private RV and tent campgrounds are along the river in Redwood National Park, and just outside of the park in the City of Klamath. These campgrounds provide opportunities for bank fishing, camping, and picnicking. Other recreation opportunities in the area are associated with

the national park and the adjacent state parks (Jedediah Smith, Del Norte Coast, and Prairie Creek Redwood State Parks), which offer hiking, hunting, and wildlife viewing. Table 3.20-4 provides a summary of the facilities associated with these parks.

Public Health Issues

As discussed in Section 3.2, Water Quality, concentrations of chlorophyll-a and *Microcystis aeruginosa* have exceeded World Health Organization (WHO) guidelines for protection from adverse effects in recent years, in both Copco 2 and Iron Gate reservoirs, as well as reaches of the Klamath River downstream of Iron Gate Dam. In 2005 and 2008, the North Coast Regional Water Quality Control Board (NCRWQCB), Karuk Tribe, United States Environmental Protection Agency (USEPA) and other local, state, and federal agencies issued a warning to residents and recreational users of the river to use caution when near these algal blooms due to possible health effects of exposure to *Microcystis aeruginosa* and its microcystin toxin. Effects range from mild, non-life threatening skin conditions to permanent organ impairment and death, depending upon exposure time and intensity (FERC 2007). As identified in comments received during the scoping period for this Klamath Facilities Removal EIS/EIR, these water quality issues and public health warnings have resulted in reduced recreational activity in affected river segments in recent years.

Whitewater Boating Opportunities

Extensive whitewater boating opportunities exist downstream of Iron Gate Dam. Depending on the river segment and level of flow, there are opportunities for play, standard, and big water boating on Class II and III waters.[2] These runs are boatable in rafts, kayaks, inflatable kayaks, and open canoes. Table 3.20-6 summarizes the acceptable flow ranges for reaches downstream of Iron Gate Dam.

Although not as challenging as the Hell's Corner Reach upstream, there are a few rapids that are sometimes rated Class IV, including Hamburg and Upper Savage on the Otter's Playpen run, Rattlesnake on the day-use run below Happy Camp, and Dragon's Tooth between Ferry Point and Coon Creek Access. There is also a well-known kayak playboating wave known as the "School House Wave" between Skehan Bar and Gottville. This wave is typically available during low to moderate summer flows and is popular with local kayakers from the Mount Shasta, Klamath Falls, and Ashland areas (PacifiCorp 2004). There is also a Class VI rapid at Ishi Pishi Falls (Somes Bar) that boaters are strongly advised to portage around (Cascade Outfitters 2010).

The primary whitewater boating season is in summer (June through August), when water temperatures are warm; however, the river can be boated in most months of the year (PacifiCorp 2004). There is less whitewater rafting downstream of the Trinity River confluence after the river turns northwest into strong prevailing winds. There are fewer developed river access points along this reach than in the reaches upstream. Also, much of this reach is located within the boundaries of the Yurok Tribe Indian Reservation. Data collected by the USFS and BLM indicate that substantially more whitewater boating

[2] As rated by the American Whitewater International Scale of Difficulty (AW 1998).

occurs on the Klamath River below Iron Gate Dam than in the Klamath River upstream to J.C. Boyle Dam. From 1994 through 2009, the average annual number of user days was 14,392 per year. However, whitewater boating in this portion of the Klamath River has decreased somewhat in recent years. In part, this decline is due to the presence of microcystin blooms in the river. Total user days from 2000 through 2003 ranged from 13,976 to 15,349 per year, whereas from 2005 through 2009, total user days ranged from 11,751 to 15,279 per year (DOI 2011a).

Fishing Opportunities

The Klamath River downstream of Iron Gate Dam has high quality angling opportunities extending nearly 200 miles to the Pacific Ocean and is open to fishing year-round. This reach, designated a national WSR (see Section 3.20.3.5 below) attracts and supports several fishing outfitter services that focus on salmon, steelhead, and trout fisheries. A review of outfitters conducted as part of the Secretarial Determination process identified over 50 outfitters providing sport fishing, boat fishing, and/or fly fishing trips on the Klamath River. Twenty-seven river access sites within the Klamath National Forest provide access for fishing in this section of the river. Use at the sites varies; however, most are rated as light usage (Klamath National Forest 2010). Tables 3.20-12 and 3.20-13 provide recent use data for Chinook salmon and steelhead fishing on the Klamath River. As shown in the table, angler success varied annually, but was much greater in the first half of the decade than in the latter half. The USFS reported that the decline in fish production in the past few decades triggered a similar decline in the guide and resort industry, as well as sport fisheries (FERC 2007) (see also Section 3.15, Socioeconomics). In addition, decreased abundance of anadromous fish species resulted in restrictions on the fishing seasons for certain runs of Chinook salmon in 2006 and 2008 (National Oceanic and Atmospheric Administration [NOAA Fisheries Service] 2006).

Downstream of the Trinity River confluence, angling in the Klamath River is dependent on the annual status of the fall-run Chinook salmon run, so the number of businesses that offer angling guide services changes from year to year. The main run of Klamath River Chinook salmon peaks in late fall and is normally over by mid-January each year; the steelhead season normally starts in November (see also Section 3.3, Aquatic Resources).

Anglers fish from boats and the bank. Most of the boat fishing occurs from drift boats or rafts. Fishing regulations allow anglers to keep up to five trout per day and most of the fishing activity occurs in summer and fall. Limits on salmon and steelhead have varied over the years, and regulations depend on whether the fish is wild or from the Iron Gate Hatchery. Most anglers catch and release steelhead (PacifiCorp 2004).

Table 3.20-12. Estimated Number of Recreational Salmon Angler Days and Chinook Salmon Harvest on the Klamath River (excluding the Trinity River), 2001-2010.

Year	# Angler Days	Chinook Salmon Harvest (# Fish)		
		Adults	Grilse	Total
2001	28,251	9,621	1,044	2,904
2002	24,993	9,769	1,197	4,942
2003	23,259	7,322	1,365	10,986
2004	24,751	3,463	651	10,420
2005	17,789	1,029	589	7,911
2006	12,141	57	2,293	5,756
2007	19,597	4,975	912	1,941
2008	15,249	1,560	5,202	5,259
2009	20,755	4,820	257	5,232
2010	16,219	2,610	4,039	5,599
01-05Avg	23,809	6,241	1,162	7,403
06-10Avg	16,792	2,804	2,620	5,425

Table 3.20-13. Estimated Number of Recreational Steelhead Angler Days on the Klamath River (excluding the Trinity River), 2003-2008

Year	# Angler Days
2003	19,183
2004	14,345
2005	13,216
2006	19,371
2007	15,622
2008	21,192
03-08Avg	17,155

3.20.3.5 Wild and Scenic Rivers Designation

Two segments of the Klamath River are designated WSRs, one in Oregon and one in California (Figure 3.20-3). The reach in Oregon, between the J.C. Boyle Powerhouse and the Oregon/California state line was designated a WSR in 1994. In California, the entire river below Iron Gate Dam was designated wild and scenic in 1981 because of the outstandingly remarkable anadromous fisheries, including that of salmon and steelhead trout. WSR boundaries include variable-width linear corridors which typically include not more than 320 acres per linear mile (averaging up to approximately 0.5 miles in width along the river corridor); however, some protections for designated outstanding remarkable values can extend beyond the designated boundaries.

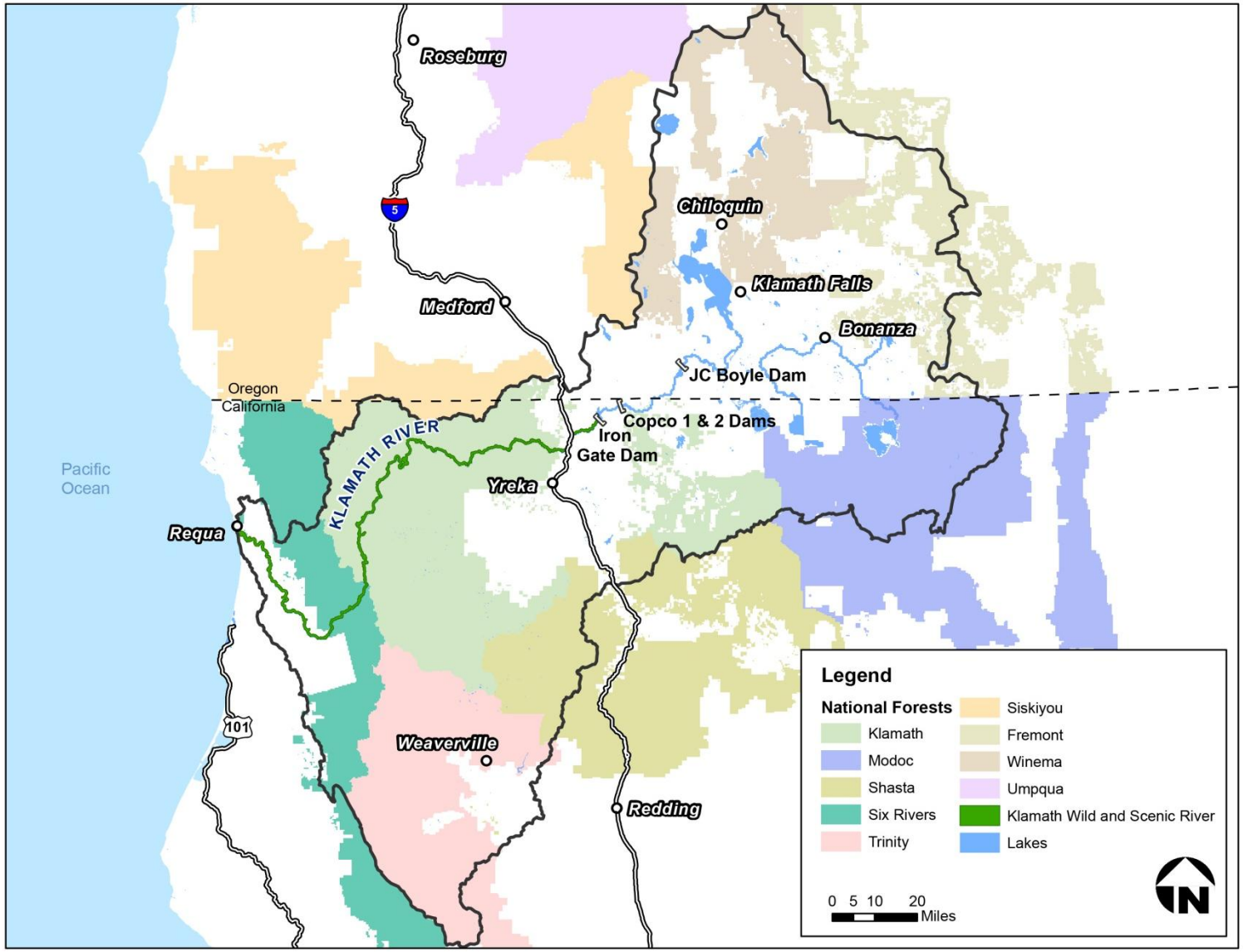

Figure 3.20-3. Klamath Wild and Scenic River Corridor

Oregon Klamath River WSR Component

The segment of the Klamath River in Oregon, beginning immediately downstream of the J.C. Boyle Powerhouse and flowing 11 miles to its terminus at the Oregon/California state line, was added to the NWSRS through Section 2(a)(ii) of the WSR Act. The river is classified as scenic and possesses outstandingly remarkable scenic, recreational, fish, wildlife, pre-history, history, and American Indian Traditional Use values. The following subsections summarize the existing conditions in the Klamath River at the time of the WSR designation (1994) of the Oregon component.

Scenic

The Upper Klamath River (upstream of Iron Gate Dam) was evaluated by BLM in 1977 and 1981, and received a Scenic Quality Class A rating, the highest scenic quality classification. The 2006 Preliminary Determination Report (completed for the Section 7 WSR requirement during FERC relicensing of the PacifiCorp facilities) stated that scenery associated with the 11 mile Upper Klamath WSR is the main visual element in the region and exhibits more landform variety than the surrounding plateau (Bonacker et al. 2007). As the river canyon cuts across the plateau, it is characterized by cliffs, steep slopes, upland benches, alluvial terraces and the meandering river channel, "which can all be encompassed in a single view" (Bonacker et al. 2007). The unique landforms, water, and vegetation create an ever-changing landscape from desert to more mountainous terrain, and steep canyons and vertical cliffs with diverse vegetation (Bonacker et al. 2007).

Recreation

In the WSR designation, whitewater boating and recreational fishing were specifically mentioned by the Secretary as outstandingly remarkable values of the Upper Klamath WSR. Other popular recreation activities that occurred and continue within the recreation settings along the WSR reach include sightseeing, camping, hunting, OHV use, river swimming and water play, and upstream reservoir fishing and power boating (Bonacker et al. 2007). However, poor water quality conditions have adversely affected water play and river swimming within the WSR area (see section below). In 1994, at the time of the designation, the typical flow regime consisted of reliable and predictable daily hydropower peaking as provided by the KHP. Releases typically peaked in the mid-morning hours, and base flows typically occurred during the hours from late afternoon/early evening until morning. These releases provide whitewater boating opportunities throughout the summer and fall.

Water Quality

As stated in the 2006 Preliminary Determination Report, during the fall, winter, and spring, at base flow, the water appearance is not influenced by the addition of spring water because water released from the reservoir has less algae, nutrients, and turbidity. However, at the time of designation, summer base flow resulted in shallow, slow-moving waters with large amounts of visibly algae-covered rocks.

Peaking operations from the KHP change the relative proportions of cool spring water from the Bypass Reach and warm water from the reservoir and powerhouse, which

causes large artificial diurnal temperature fluctuations with higher daily maximum temperatures during power generation as compared to a run-of-river scenario. During peaking events, water appearance changes to a brownish, murky color; it is difficult to see to any depth; and large quantities of algal foam are produced and coalesce in river eddies below major rapids. During off-peak periods the relative contribution of cold clear spring discharge from the bypass reach dominates the flow (Bonacker et al. 2007).

Fisheries

The Upper Klamath River supports a genetically unique population of redband trout and two endangered species, the Lost River and shortnose suckers. The WSR designation report specified redband trout as an outstandingly remarkable value and also listed federally endangered Lost River and shortnose suckers, Klamath largescale suckers, and slender sculpin as "notable species." At the time of designation, native fish species known or suspected to occur in the Upper Klamath WSR included redband/rainbow trout; Klamath smallscale, Klamath largescale, shortnose, and Lost River suckers; tui and blue chubs; lampreys (perhaps Klamath and Klamath pit brook); sculpins (perhaps marbled only); and Klamath speckled dace (Bonacker, et al. 2007).

Wildlife

The eligibility report identified that the WSR component provided a diversity of habitats for national, regional, and locally important populations of indigenous wildlife species, including exceptional populations of birds of prey, game and other birds, ringtail cats, river otters, and other species. Numerous federal and/or state-designated threatened or endangered species (including federal and state species of concern) including peregrine falcons (*Falco peregrinus*), western pond turtles (*Clemmys marmorata marmorata*), and Townsend's big-eared bats (*Corynorhinus townsendii*) are dependent on the Klamath River. In addition, a high percentage of the wildlife species found in the Oregon WSR component were identified to be directly dependent upon, or disproportionately use, riparian habitat for breeding, foraging, resting, and migration (Bonacker et al. 2007).

California WSR Component

The segment of the Klamath River in California, beginning 3,600 feet below Iron Gate Dam and flowing 189 miles to the Pacific Ocean, as well as portions of three tributaries (Salmon and Scott Rivers and Wooley Creek) were added to the NWSRS in 1981 through Section 2(a)(ii) of the WSR Act. The mainstem Klamath River is classified as recreational with portions of the tributaries classified as scenic and wild. The anadromous fishery is the outstandingly remarkable value for the entire 286 miles of the designated component. The following subsections summarize the existing conditions in the Klamath River at the time of the WSR designation.

Scenic

Scenery within the California Klamath WSR is dominated by natural settings. Its characteristic river flows, water appearance, anadromous fish and riparian vegetation within a forested river canyon are the primary scenic aspects. Since 1981, flow regimes have varied moderately in response to water resource competition within the Klamath Basin. During summer months, these have typically been caused by water diversions

(Van de Water et al. 2006). Also, as described in Sections 3.2, Water Quality, and 3.19, Scenic Quality, reduced water clarity and discoloration resulting from algae blooms has impaired the historic scenic character of reaches downstream of Iron Gate Dam. The level of reduced water clarity and discoloration and resulting scenic quality effects is dependent on viewer location. Views from on-river, in-river, or riverside viewpoints are most likely to display substantial changes to scenic quality indicators, while these changes are less likely to be noticed as viewed from nearby river canyon roadways and communities.

The river's lowest historic flows since the WSR designation can be identified by gage data from United States Geological Survey (USGS) gage no.11516530 near Iron Gate Dam. The lowest monthly summer time flows within the 21-year historical record at Iron Gate Dam before 1981 represents the lower limits of characteristic flow variability, which still expresses its historic scenic character. Before 1981, USGS records show no Iron Gate Dam flow releases of less than 700 cfs; however, flows of less than 700 cfs occurred during 17 months between 1981 and 2004 (Van de Water et al. 2006). Since 2004, no flows of less than 700 cfs have occurred. The lowest monthly mean flows occur in summer (July and August) and have ranged from 823 to 1,373 cfs (USGS 2011). Similar to the scenic quality changes related to water quality conditions described above, seasonal and project-induced changes in flow and resulting scenic quality changes are more likely to be observed by on-water, in-water and riverside viewpoints than nearby river canyon roadways and community viewpoints.

Recreation

The flows released from Iron Gate Dam greatly influence the river's summer recreation season's whitewater boatability, challenge levels, safety hazards, potential for equipment damage, and the opportunity to access and experience the river's full range of rapids and channels. Exceptionally low summer time flow releases are especially adverse to California Klamath WSR boating activities. Table 3.20-14 compares flows at the time of the 1981 designation to flow conditions required for whitewater boating and recreational fishing (see Table 3.20-6 for optimal flow ranges) (Van de Water et al. 2006).

Although precise estimates of available recreation days in 1981 are not available, commercial recreational whitewater boating activity on the Klamath National Forest portion of the California Klamath WSR increased by approximately 34 percent between 1981 and 2005 (Van de Water et al. 2006). However, commercial activity on the lower Klamath River has decreased somewhat since 2005 from a recorded 10,695 user days to 8,230 user days in 2009, a trend consistent with other western rivers. Private recreational whitewater boating activity has followed a similar pattern, with the greatest number of user days between 1995 and 2005 (ranging from 4,193 to5,230) and decreasing somewhat since 2005 to a low of 3,525 user days in 2009, as summarized in Section 3.15, Socioeconomics (DOI 2011a).

Table 3.20-14. Comparison of 1981 Flows to the Acceptable Range for Whitewater Boating and Fishing

Month	Flows (cfs)	Whitewater Boating	Fishing
January	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
February	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
March	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
April	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
May	1,000	In acceptable boating flow range/optimal playboating range	In optimal range
June	710	Does not meet minimum boatable flow or playboating opportunities	Does not meet minimum fishing flow
July	710	Does not meet minimum boatable flow or playboating opportunities	Does not meet minimum fishing flow
August	1,000	In acceptable boating flow range/optimal playboating range	In optimal range
September	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
October	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
November	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
December	1,300	In acceptable boating flow range/optimal playboating range	In optimal range

Source: Van de Water et al. 2006.
Key:
cfs: cubic feet per second

Water Quality

Water quality issues have existed since the time of WSR designation and there is evidence indicating that these issues may have increased since that time, and even more progressively over the past 5 years (Kann and Corum 2009). Water quality issues in the Klamath, including algae blooms and microcystin toxin from one species of blue-green algae, affect river recreation users (see discussion of Public Health Issues in Section 3.20.3.4 above). Results of the toxic algal monitoring program conducted by the Karuk Tribe between 2005 and 2007 at 16 near shore stations in the Klamath River below Iron Gate Dam indicate that nearly 60 percent of samples taken between June and September exceeded the moderate risk level as defined by the WHO (Kann and Corum 2009). Additional sampling conducted in 2007 shows that the microcystin toxin is found as far downstream as the Yurok Reservation, near the river mouth (Kann 2006). In addition, the entire length of the California WSR currently does not meet NCRWQCB water quality objectives for temperature (NCRWQCB 2007). A detailed description of existing water quality is provided in Section 3.2, Water Quality.

Fisheries

The Klamath River was designated a WSR because of its free-flowing condition and its outstandingly remarkable anadromous fisheries, including that of salmon and steelhead trout. Even at the time of designation, decreasing salmonid trends in the Klamath River system were identified as being affected by various factors, including dam construction and operations related to hydropower generation in the Klamath River. Such factors have resulted in increased summer water temperatures, changed the natural flow regime, decreased dissolved oxygen levels in portions of the river, and blocked access to more than 350 miles of spawning, incubation, and rearing habitat. Scientific evidence shows that Chinook salmon, coho salmon, cutthroat trout, and steelhead trout were historically present above Iron Gate Dam (Hamilton et al. 2005).

According to a 1981 California Department of Water Resources (CDWR) study, spawning conditions in the reach immediately downstream from Iron Gate Dam were already impaired due to a coarsening of the bed below the dam. Although the reach below Iron Gate Dam was historically a prime spawning area, by 1981 the reach produced few salmon and the riffles within the reach contained cobbles too large for salmon to move. Prior to the 1981 WSR designation, the reach between Iron Gate Dam and Shasta River was scoured by daily peak flows from Copco 1 and Copco 2 operations prior to the construction of Iron Gate Dam (Van de Water et al. 2006).

Streambed armoring as a result of low flows and reduced gravel recruitment can decrease habitat diversity within channels, making the river less hospitable to juvenile salmonids. Armoring can also lead to the cementation of spawning gravels, impairing the ability of spawning adults to make redds. Armoring can also decrease the amount of habitat available (interstitial spaces) to macroinvertebrates, an important food source for fish. Given the findings of the 2006 study, it appears that much of the riverbed coarsening had occurred prior to the WSR designation (Van de Water et al. 2006). However, impacts from dams progress over time so one would expect that continued sediment depletion (by the retention of sediment behind the dams) would continue to worsen spawning habitat below the dam (Ligon et al 1995; Kondolf 1997; and Grant et al 2003).

River flows also affect fisheries' population and abundance. Table 3.20-14 shows the monthly flows at the time of the WSR designation. Flows are a key component of cumulative effects from water management on the aquatic environment. The flow regime downstream of Iron Gate Dam affects aquatic resources through instream flow influences on physical habitat (depth, velocity, substrate, and cover) and on water quality that may affect the prevalence of disease pathogens (Bartholow et al. 2005).

Estimates of abundance for anadromous fisheries at the time of the WSR designation are not available for all species. Table 3.20-15 provides estimates of abundance at the time of designation, or as near as possible to the time of designation for those species for which data is available. As discussed in Section 3.3, Aquatic Resources, the abundance of anadromous fisheries has decreased since the time of the WSR designation. Specific units of coho salmon in the Klamath River were listed as threatened under the ESA in 1997. Similarly, the green sturgeon was listed by NOAA Fisheries Service as a Species of

Concern in 2005 and designated as threatened under the ESA in 2010. The Lost River and shortnose sucker were designated as endangered in 1988 after the WSR designation in California and after the designation in Oregon.

Table 3.20-15. Estimated Abundance of Fish Species at the 1981 WSR Designation

Species	Estimated Abundance
fall Chinook salmon	Natural spawners – 4,000 (1981)
	Iron Gate hatchery spawners – 21,595 (1981)
coho salmon	3,400 (1984)
summer Steelhead	110,000 (average 1977-1991)
winter Steelhead	20,000 (average 1977-1991)

Source: Van de Water et al. 2006

Wildlife

Wildlife populations have not been systematically surveyed on the Klamath River. Baseline data were not collected in 1981; therefore, population numbers or trends are not available for most species in specific areas like the WSR corridor.

Riparian vegetation provides habitat for feeding, breeding, and sheltering for willow flycatchers, western pond turtles (a species of special concern in California) and various other wildlife species along the river. There is no reference condition for the riparian vegetation in 1981 (Van de Water et al. 2006). The project area includes a large number and diversity of wildlife species. Surveys conducted by PacifiCorp in 2002 and 2003 identified five amphibian species, numerous bird species, including 19 species of birds of prey, and numerous mammal species, including black-tailed jackrabbit, mule deer, and California ground squirrels. See Section 3.5, Terrestrial Resources, for further discussion of wildlife populations within the Klamath River corridor.

Eligible and Suitable WSR Section on the Klamath River

In 1990, BLM found the 5.3-mile section of the Klamath River from the Oregon/ California state line to the slack water of Copco 1 Reservoir to be eligible and suitable for WSR designation. The river segment is free-flowing and possesses outstandingly remarkable scenic, recreational, fish, and wildlife values. This river segment is not a designated WSR and is not protected under the WSR Act and its Section 7(a) requirements. BLM is required within its authorities, to protect this suitable river segment's free-flowing character, water quality, and outstandingly remarkable river values. This segment of the Klamath River is also listed on the Nationwide Rivers Inventory (NPS 2009).

3.20.4 Environmental Consequences

3.20.4.1 Effects Determination Methodology

This discussion of environmental effects considers the implications of the Proposed Action and identified alternatives on the potential changes to river- and reservoir-based recreation opportunities, activities, and settings within the study area. The relocation of the City of Yreka's water supply pipeline would not result in any impacts to recreational resources; therefore, it is not addressed in this section of the EIS/EIR. The analysis presented below includes an assessment of both short-term and long-term effects on access, flow-dependent recreational activities, recreational fishing, and other recreational activities associated with the existing Klamath River corridor and reservoir recreational facilities within the study area.

Recreational Setting, Facilities, and Access

Likely changes to recreational use and access under each identified alternative were assessed qualitatively, including changes from reservoir-based recreational opportunities to more river-based opportunities in the areas where the dams, recreational facilities, and/or PacifiCorp facilities would be removed. The short-term effects analysis includes a discussion of potential areas where recreational access would be restricted due to construction activities. The assessment of long-term effects discusses potential changes in the recreational setting and experience, changes in water quality and reservoir area revegetation.

Whitewater Boating Opportunities

Optimal and acceptable flows for whitewater boating opportunities along reaches of the Klamath River were assessed as a part of the technical review completed for the Secretarial Determination. Flow values that fall within these ranges are considered acceptable flow levels for the various activities (see Table 3.20-6).

DOI conducted hydrologic modeling to assess changes in the availability of acceptable flows under the various alternatives. The Lead Agencies subjected the modeling results for each water year type to a statistical analysis (paired T-tests) to determine whether the difference in number of days meeting the acceptable range of flows following dam removal (both on an annual and monthly basis) would be statistically significant. The Lead Agencies used a qualitative approach to assess the effects of the identified alternatives on whitewater boating access and existing whitewater boating opportunities.

Recreational Fishing Opportunities

The Lead Agencies used the results of DOI's hydrologic modeling to; determine whether changes in flow would affect recreational fishing opportunities (i.e., number of days with optimal flows for recreational fishing), qualitatively assess potential changes in fisheries populations and abundance; and determine effects of changes from reservoir-based fishing opportunities to river-based opportunities.

Other Recreational Opportunities

The analysis also includes an assessment of other recreational activities, such as sightseeing, swimming/wading/tubing, fish and wildlife viewing, and camping that occur

within the river corridor and a qualitative discussion of the effects of the various alternatives on these activities. The discussion here covers both anticipated short-term effects, such as construction-related effects, and long-term effects, such as changes in reservoir-based swimming opportunities.

Wild and Scenic River Assessment

For each of the four protected resources specified in the WSR Act Section 7 (a) (scenic, recreational, fish, and wildlife), criteria have been developed to assess the effects of the alternatives as compared with conditions at the date of the river's designation into the NWSRS (see Section 3.20.3.5). For each designated river component, the type (positive or negative) and duration (short-term or long-term) of the effects are described. The magnitude of these effects may be analyzed in a future WSRA determination. The effects are characterized as unchanged, increased, or decreased (or similar conclusion), by criteria, for that resource.

3.20.4.2 Significance Criteria

For the purposes of the EIS/EIR, the following Recreation and WSR impacts would be significant if they would result in the following:

- Substantial restrictions on recreational access or reduction in the quality of recreational experiences in the vicinity of the subject reservoirs;
- Substantial decreases in the availability of reservoir/lake-based recreational opportunities;
- Substantial reduction in the quality of water-contact-based recreational activities;
- Substantial decreases in access for whitewater boating opportunities;
- Substantial changes in the amount of days providing acceptable flows for recreational activities; and/or,
- Diminution of the scenic, recreational, fisheries, and/or wildlife values of the designated WSR as present at the date of designation.

3.20.4.3 Effects Determinations

Alternative 1: No Action/No Project

The No Action/No Project Alternative would not change existing recreation access and opportunities. Under the No Action/No Project Alternative, no change to existing conditions, recreational facilities or opportunities at J.C. Boyle, Copco 1, or Iron Gate Reservoirs would occur. Similarly, whitewater boating and recreational fishing opportunities in reaches between J.C. Boyle Dam and Copco Reservoir and downstream from Iron Gate Dam would remain as described in the Affected Environment. As described in the Affected Environment, recreation activities in the reaches between J.C. Boyle Dam and Copco Reservoir (e.g., Hell's Corner Reach) are flow-dependent and rely on daily peaking hydropower operations.

Under the No Action/No Project Alternative, these operations would continue and opportunities for whitewater boating and fishing in these reaches would remain as described. Within the subject reservoirs and downstream of Iron Gate Dam, poor water quality conditions and decreased abundance of anadromous fish species have resulted in

adverse existing conditions for recreational activities, including complete closures of fishing seasons for certain species and public health warnings against water-contact-based activities during algal blooms in the summer. **Under the No Action/No Project Alternative, existing impacts on recreational fishing within the river and water-contact-based activities at the subject reservoirs would have no change from existing conditions.**

Ongoing Restoration Actions

Ongoing restoration actions would continue to take place under the No Action/No Project Alternative. Construction and implementation activities associated with these ongoing projects could result in effects to recreational resources and opportunities in the areas where construction takes place.

Ongoing actions considered for impact to recreational resources under the No Action/No Project Alternative include:

- Ongoing restoration actions
- Agency Lake and Barnes Ranches project

Construction activities associated with ongoing programs could temporarily restrict access to recreational opportunities. Construction activities including channel construction, floodplain rehabilitation, fish passage and facilities construction, and breaching levees would likely involve the use of heavy equipment along floodplain and riparian areas and could result in restrictions to public access for recreational activities, such as sightseeing, bank fishing, swimming, and wading. Because restoration activities would occur throughout the entire basin, specific sections of the river could be closed for a period of time throughout implementation of the ongoing restoration programs. However, as described in the Affected Environment section, there are a number of recreational areas offering similar activities and settings throughout the basin. It is likely that for any particular project, there would be an alternative recreational area nearby that could be used during temporary closures. **Thus, potential impacts to recreational opportunities would be less than significant. Implementation of specific projects will require future environmental compliance as appropriate.**

Construction activities could result in short-term water quality impacts which could affect recreational opportunities. Erosion and sedimentation during construction activities has the potential to temporarily decrease water quality and reduce water visibility for boaters, swimmers, and fisherman. These short-term water quality impacts would be anticipated to occur throughout the basin where construction activities take place. Specific sections of the river could be affected for a period of time throughout implementation of the ongoing restoration programs. However, following implementation and related construction activities for ongoing restoration programs including the Wood River Wetland Restoration, water quality and clarity in Upper Klamath Lake would be expected to improve. Additionally, as described above, short-term impacts would be offset by the ability of visitors and local recreationalists to use recreational areas with similar activities and settings throughout the basin. **Potential impacts would be**

short-term and, with implementation of construction best management practices (BMPs), would cause less than significant water quality related recreational impacts. Implementation of specific projects will require future environmental compliance as appropriate.

Ongoing actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin. It is expected that correction of fish passage issues throughout the basin would restore fish access to new and historic habitats and result in increased fish populations. Ongoing restoration programs could continue to improve fish passage and habitat conditions in the basin which could benefit recreational fishing opportunities. **It is expected that continued implementation of restoration programs would benefit recreational experiences throughout the Klamath Basin. Implementation of specific projects will require future environmental compliance as appropriate.**

Alternative 2: Full Facilities Removal of Four Dams (Proposed Action)

Demolition activities could temporarily restrict recreational access in the vicinity of the reservoirs. Short-term demolition activities associated with dam removal would result in temporary loss of access to recreational facilities at the subject reservoirs and associated reservoir-based recreational opportunities. Access could remain restricted for an additional period following completion of dam removal as restoration activities are conducted on the former reservoir area and existing recreational areas are modified to accommodate the new river channel. However, as described in Section 3.20.3.1, Regional Opportunities, a number of reservoirs and lakes are present within and adjacent to the Klamath Basin and provide similar opportunities for recreational activity. **Therefore, temporary impacts on recreational access in the vicinity of the subject reservoirs would be less than significant.**

Temporary impacts from demolition activity (i.e., increased noise and dust) could decrease the quality of recreational experiences in the vicinity of the reservoirs. As described in Section 3.9, Air Quality, and Section 3.23, Noise and Vibration, the use of heavy vehicles and equipment during dam removal would result in a temporary increase in dust and ambient noise in the vicinity of the subject reservoirs. These increases could indirectly result in a decrease in the quality of recreational experiences at nearby facilities that would not have restricted access during construction (e.g., trails and private parks not directly affected by construction). Specific effects related to noise and dust are discussed in detail in their respective sections; with regard to recreational activities, increases in ambient noise and air pollutants could impede visitors' ability to rest and relax, and disrupt bird and wildlife viewing opportunities. These effects would last for the duration of demolition activity; however, as shown in Figures 3.20-2(a-c), the majority of recreation facilities and access points at the subject reservoirs are located a distance away from the dams and would continue to provide opportunities for recreation until drawdown is completed. Further, as described in Section 3.20.3.1, Regional Opportunities, numerous other recreational areas are available within the vicinity of the subject

reservoirs that provide similar recreational opportunities. **Therefore, these temporary noise and dust impacts would be less than significant.**

Dam removal could permanently decrease the availability of reservoir/lake-based recreational opportunities in the area of analysis. The removal of the Four Facilities would eliminate existing opportunities for reservoir-based recreation activities, such as power boating, waterskiing, lake swimming, and flat-water boat angling, provided at J.C. Boyle, Copco 2, and Iron Gate Reservoirs. As discussed in the Affected Environment section, the subject reservoirs are popular recreational areas for sightseeing, fishing, camping, swimming, boating, and wildlife viewing and attract visitors primarily from the surrounding communities in Klamath and Jackson County, Oregon and Siskiyou County, California. As indicated in the responses to visitor use surveys conducted by PacifiCorp, the reservoirs are popular recreation areas in part because they are uncrowded relative to other lakes in the area and do not require user fees. While some activities associated with reservoir recreation could still be possible in the newly created river channel (e.g., swimming and wading), due to increased flows, swimming opportunities and flat-water boating may be limited in certain times of year and in wet water years. Thus, there would be a permanent loss of reservoir-based recreational opportunities in the immediate region. However, as shown in Table 3.20-2, a number of other lakes and reservoirs are in the vicinity of the subject reservoir and provide similar opportunities for recreation in an uncrowded setting (e.g., Fourmile Lake, Agency Lake, Applegate Reservoir, Medicine Lake). Therefore, the loss of the subject reservoirs would not result in a substantial decrease in regional lake-based recreational opportunities. Further, recreational opportunities would remain available on and along the newly created river channel. **Therefore, impacts on the regional availability of reservoir-based recreational opportunities would be less than significant**.

Dam removal could permanently remove recreational facilities associated with the reservoirs. Under the Proposed Action, the recreational facilities constructed to accommodate reservoir recreation, with the exception of Topsy Campground, Fall Creek and Jenny Creek Day Use Areas, and the Iron Gate Fish Hatchery Day Use Area, would be completely removed and the former recreation areas, parking areas, and access trails would be regraded and revegetated (O'Meira et al. 2010). This would result in a permanent decrease in recreational access since they will be too distant from the newly formed Klamath River to serve as river access points. Dam removal would permanently decrease the availability of reservoir recreational opportunities (as described above), and the removal of existing recreational facilities would limit access to recreational opportunities along and within the newly formed river channel. However, as described in Section 3.20.3.1 Regional Opportunities, a number of reservoirs and lakes are present within and adjacent to the Klamath Basin and provide similar opportunities for recreational activity. **These impacts on recreational facilities associated with the subject reservoirs would be considered permanent however, implementation of Mitigation Measure REC-1 would ensure that these impacts in the long term would be less than significant.**

Dam removal could not adversely affect developed recreational facilities upstream and downstream of the subject reservoirs. No impacts on recreational facilities upstream of the dam removal sites would occur as a result of removal of the Four Facilities because any changes to flow and water quality would occur downstream of J.C. Boyle Dam. However, as discussed in Section 3.3, Aquatic Resources, removal of the dams would help restore the presence of anadromous fish to the Klamath River above J.C. Boyle reservoir which would beneficially affect recreational fishing at these upstream facilities. Removal of the dams is expected to result in water quality improvements downstream of Iron Gate Dam (see Section 3.2, Water Quality), which could improve visitor perceptions and attract a greater number of visitors to existing recreational facilities. However, land-based facilities would not be physically affected by removal of the dams and drawdown of the reservoirs, since, as discussed in Section 3.11, Geology, Soils, and Geologic Hazards, the river is largely confined by bedrock and there would be little change to floodplain areas or the river channel itself. **Any impacts on upstream and downstream recreational facilities would be less than significant.**

Sediment release downstream during reservoir drawdown could decrease the quality of water-contact-based recreational opportunities. As discussed in Section 3.2, Water Quality, drawdown of the reservoirs would result in short-term increases in turbidity downstream of the PacifiCorp reservoirs. Turbidity would be most pronounced immediately downstream of Iron Gate Dam (between Iron Gate Dam and Bogus Creek), and less so farther downstream, and is expected to be flushed through the system quickly (less than 2 years). This increase in turbidity would reduce visibility for boaters, swimmers, and fisherman during the sediment flushing period and could result in reduced public draw for these activities (e.g., swimmers might be less likely to enter the river and fisherman might be less successful due to the reduced water clarity). Increased turbidity would also affect safety considerations during swimming if swimmers are unable to see the river bottom or navigate around obstacles, such as large boulders or logs beneath the water surface. However, impacts would be temporary; following completion of reservoir drawdown activities, water quality and clarity would be expected to improve as sediments are flushed downstream and into the Pacific Ocean. Impacts would not be widespread throughout the river; opportunities for fishing and swimming in non-turbid waters would remain available during the drawdown period.

Sediment release could also decrease the quality of water-contact-based recreational opportunities if sediment released downstream resulted in longer-term deposition in pools, eddies, slack water, and beaches and decreased the availability of these areas for recreational activity. As discussed in Section 3.11, Geology, Soils, and Geologic Hazards, modeling was conducted to determine the potential for such deposition following dam removal. The results of the modeling indicated that following dam removal, deposition would occur primarily between Iron Gate Dam and Cottonwood Creek and there would be no substantial change in river bed elevation. Depending on the water year type following sediment release, the coarse sediment load would take between 15 months and 2 years to be completely flushed downstream and into the Pacific Ocean. In contrast, if drawdown were to occur during a dry year, modeling indicates that substantial sand deposition would still be present between Iron Gate Dam and Bogus

Creek at the end of the two year modeling period. Therefore, it is unlikely that sediment release would decrease the availability of pools, eddies, or beaches for recreational activity, even temporarily. **Therefore, impacts on the quality of water-contact-based recreational opportunities would be short term and less than significant.**

Changes in water quality associated with dam removal could positively affect water-contact-based recreational opportunities. Dam removal is expected to result in long-term improvements in water quality, notably decreased prevalence of microcystin toxin (see Section 3.2, Water Quality). As discussed in Section 3.2, Water Quality and 3.20.3.2 above, microcystin toxin has been associated with public health risks for recreational bathing waters and health warnings issued in 2005 and 2008 by the USEPA and other agencies warned recreation visitors to use caution due to potential health effects. In addition, about two-thirds of recreation visitors to the subject reservoirs had negative perceptions of water quality, stating concerns of bad odors and algae blooms, which restrict areas available for fishing, swimming and wading. These adverse effects related to water quality negatively influenced the quality of the recreational experience for visitors and also resulted in safety risks to the recreational visitors. **Because existing conditions for water-contact-based recreational activities are considered adverse due to water quality, improved water quality conditions would result in long-term beneficial effects.**

Dam removal could impede access for whitewater boating opportunities. Dam removal would not affect whitewater boating access locations, as access areas are at established areas along the Klamath River channel, outside of the subject reservoirs and would not be affected by dam removal. As discussed in the impact analysis above and in Section 3.11, Geology, Soils, and Geologic Hazards, drawdown of the reservoirs would not result in substantial changes to the floodplain or river channel. Thus, no impacts to land-based recreational facilities are expected. **Therefore, there would be no adverse impacts on whitewater boating access downstream of Iron Gate Dam.** However, in the reaches between the existing dams, particularly in the Hell's Corner Reach, whitewater boating access would likely be affected due to dam removal activities and sedimentation, as discussed previously. **Impacts in reaches between the existing dams would be short term and less than significant**.

Dam removal could increase the number of days with acceptable flows for various recreational activities in the Klamath River. DOI modeled the average number of days providing acceptable river flows in specific reaches each month for specific recreational activities, both with and without dam removal (full modeling data is presented in Appendix R; DOI 2011b). Table 3.20-16 presents a summary of the model results, and Figures 3.20-4 through 3.20-11 show the results for each of the river reaches. The modeling results indicate that the greatest changes would occur in the Bypass Reaches, J.C. Boyle and Copco 2 Reaches, and in the existing peaking reach, Hell's Corner Reach. For the Keno Reach (see Figure 3.20-4) and the reaches downstream of Iron Gate Dam (Figures 3.20-8 through 3.20-11), the changes in the availability of flows within the acceptable flow ranges for whitewater boating and fishing opportunities would be

negligible. **Therefore, impacts on whitewater boating and fishing opportunities in these reaches would be less than significant.**

Table 3.20-16. Estimated Number of Days Meeting the Range of Acceptable Flows for Recreational Activities on the Klamath River

River Reach	Activity	Acceptable Flow Range		Total Avg. No Days Annually		
		Low Value (cfs)	High Value (cfs)	Dams In	Dams Out	Percent Change
Keno Reach	Whitewater Boating	1,000	4,000	151	139	-7.9%
	Fishing	200	1,500	246	238	-3.5%
J.C. Boyle Bypass Reach	Whitewater Boating	1,300	1,800	5	41	793.6%
	Fishing	200	1,000	107	142	32.6%
Hell's Corner Reach	Whitewater Boating/Rafting	1,300	3,500	278	119	-57.1%
	Fishing	200	1,500	234	228	-2.7%
Copco 2 Bypass Reach	Whitewater Boating	600	1,500	10	223	2,083.8%
	Fishing	50	600	14	3	-79.4%
Iron Gate to Scott River	Whitewater Boating/Fishing	800	4,000	278	281	1.0%
Scott River to Salmon River	Boating	800	7,000	243	246	1.4%
	Fishing	800	4,000	175	182	4.2%
Salmon River to Trinity River	Whitewater Boating/Fishing	800	10,000	207	211	1.8%
Trinity River to Ocean	Whitewater Boating/Fishing	1,800	18,000	239	238	-0.2%

Source: Recreation Sub-Team, Appendix R
Key:
cfs: cubic feet per second

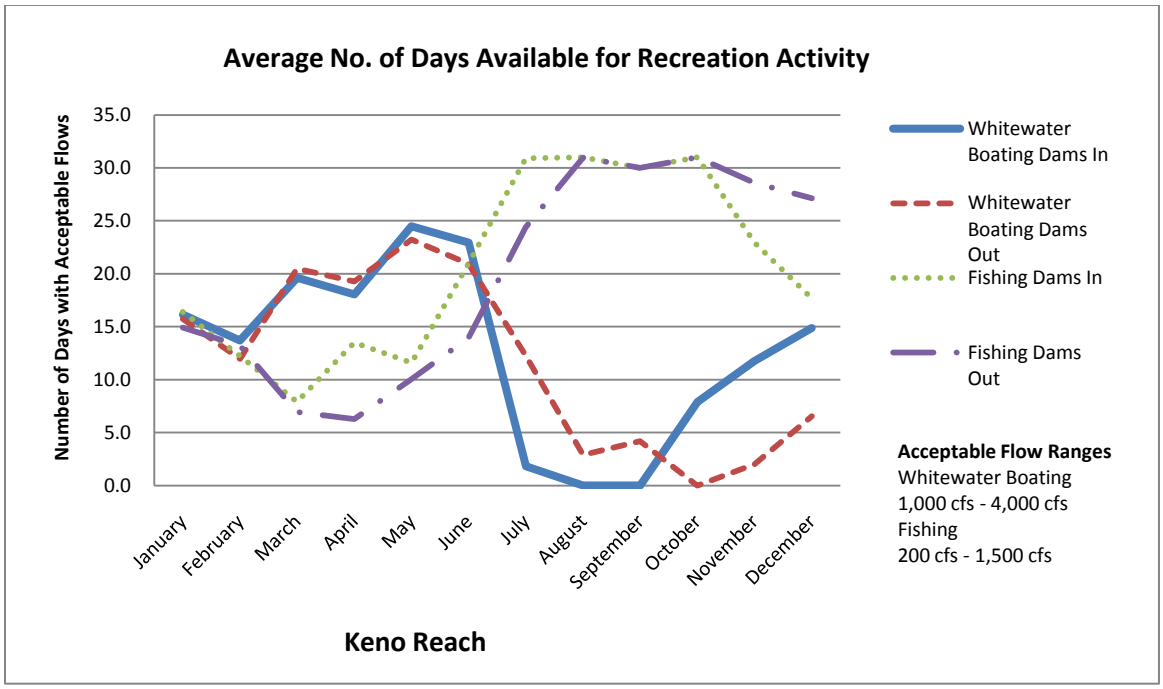

Figure 3.20-4. Comparison of Available Recreation Flows Keno Reach

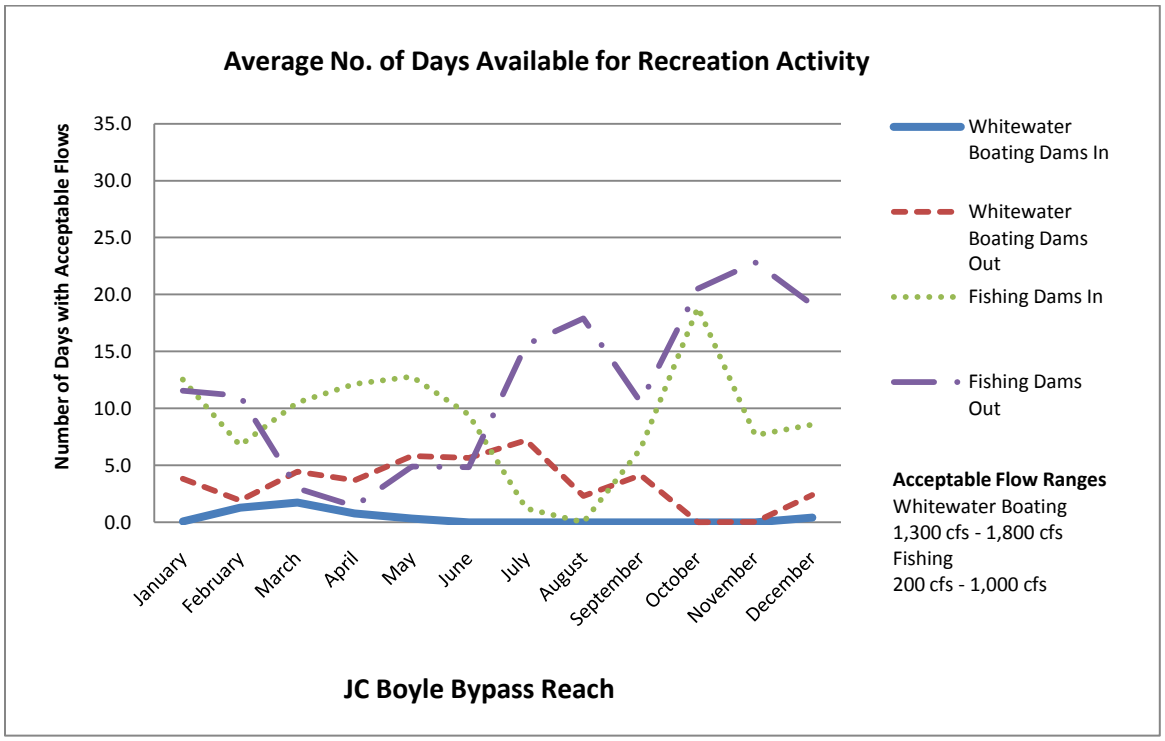

Figure 3.20-5. Comparison of Available Recreation Flows - JC Boyle Bypass Reach

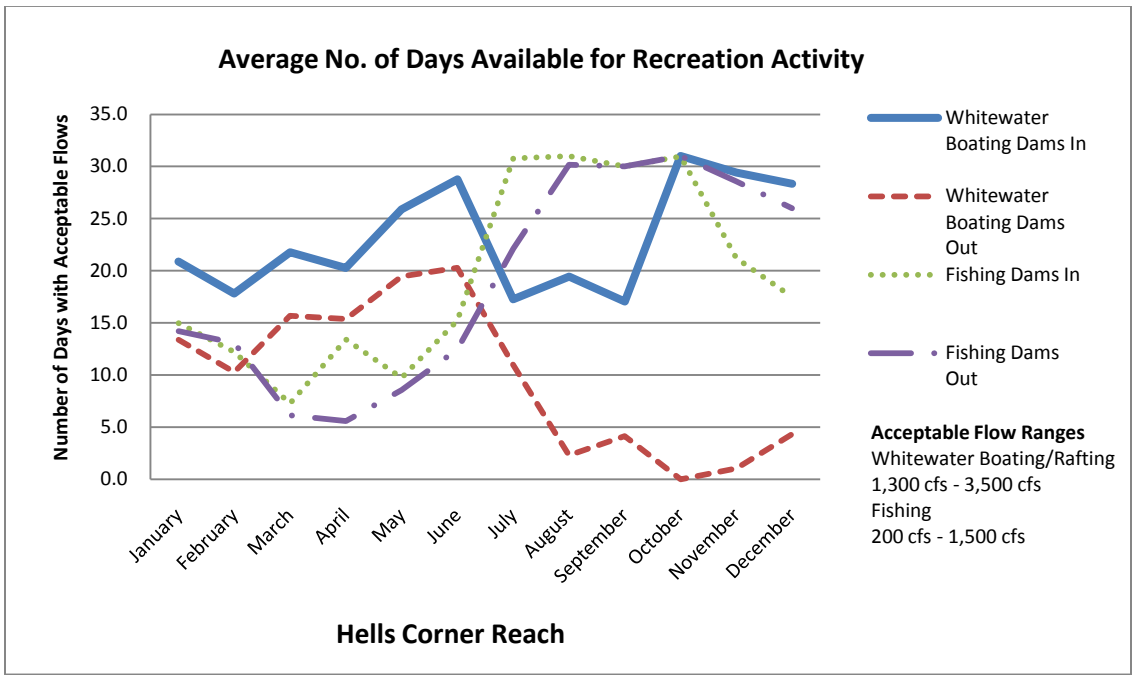

Figure 3.20-6. Comparison of Available Recreation Flows - Hell's Corner Reach

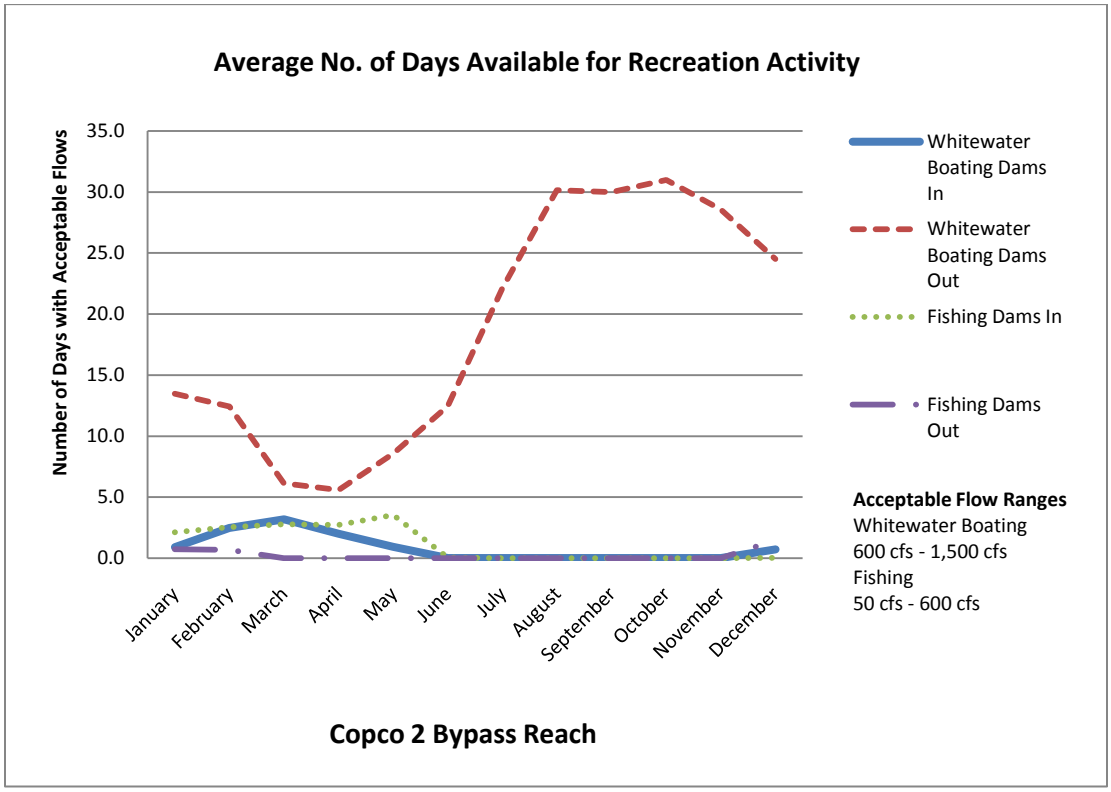

Figure 3.20-7. Comparison of Available Recreation Flows - Copco 2 Bypass Reach

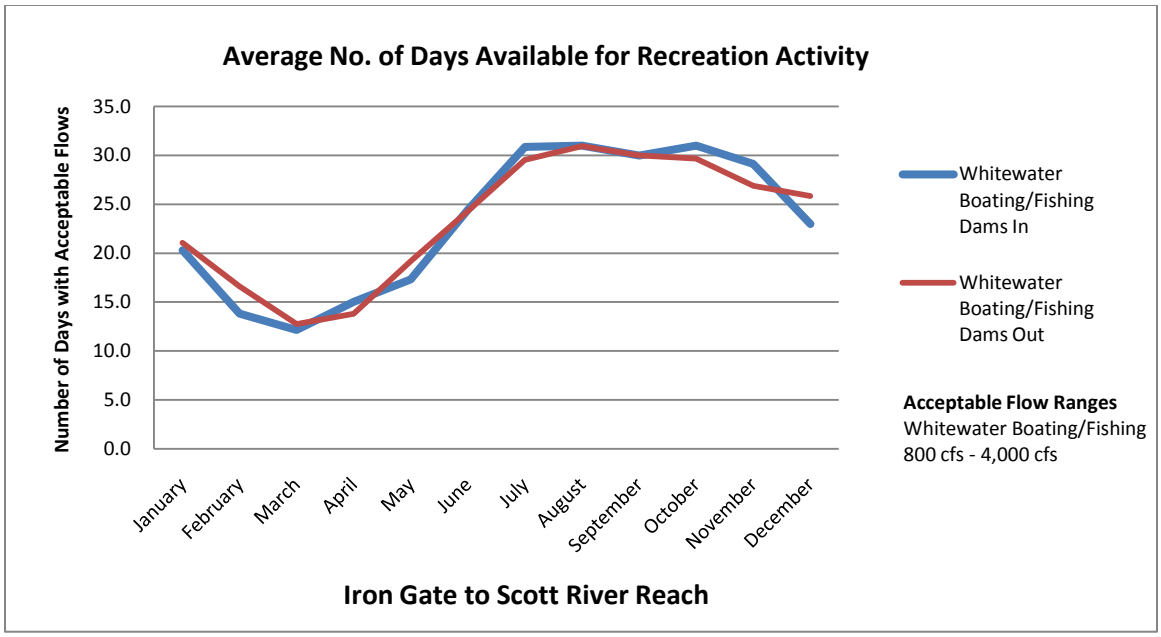

Figure 3.20-8. Comparison of Available Recreation Flows - Iron Gate to Scott River Reach

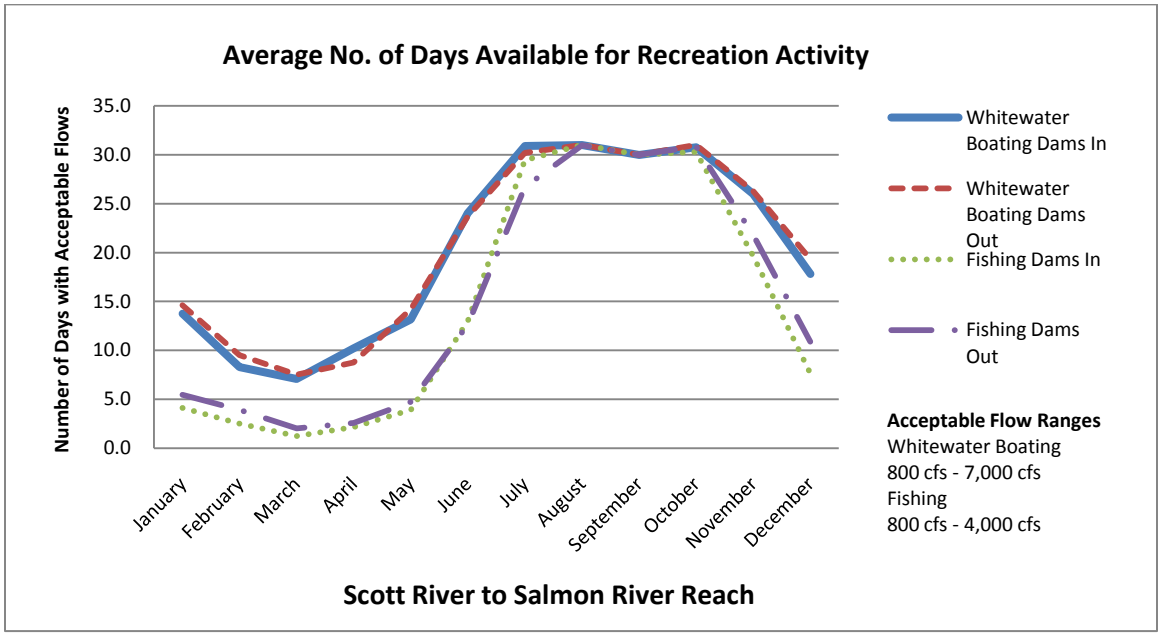

Figure 3.20-9. Comparison of Available Recreation Flows - Scott River to Salmon River Reach

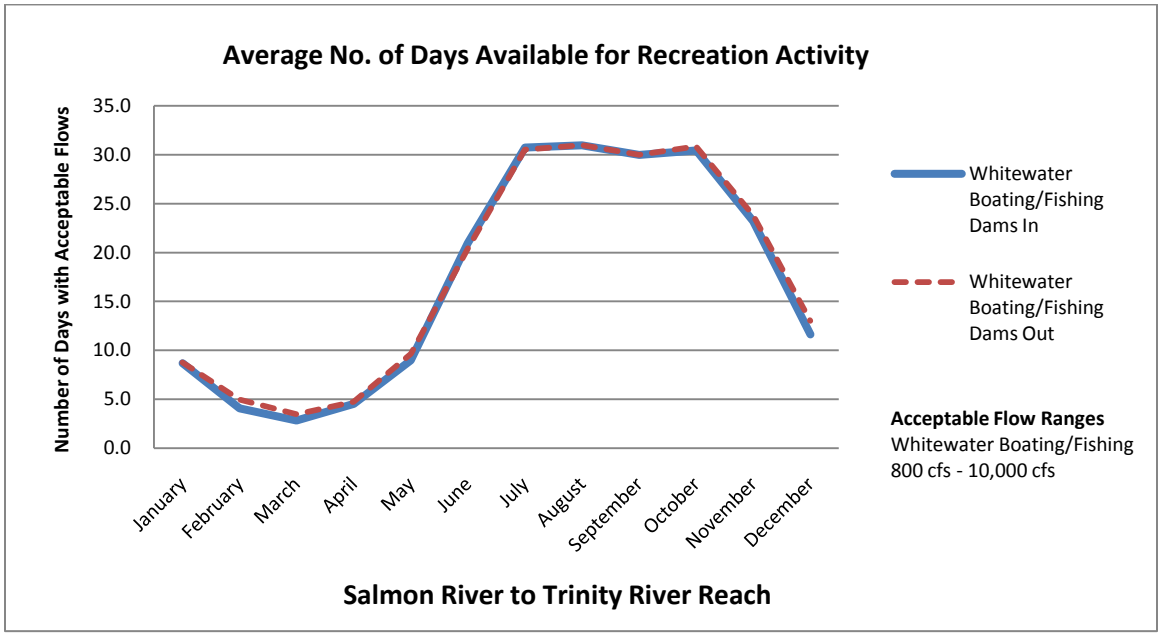

Figure 3.20-10. Comparison of Available Recreation Flows - Salmon River to Trinity River Reach

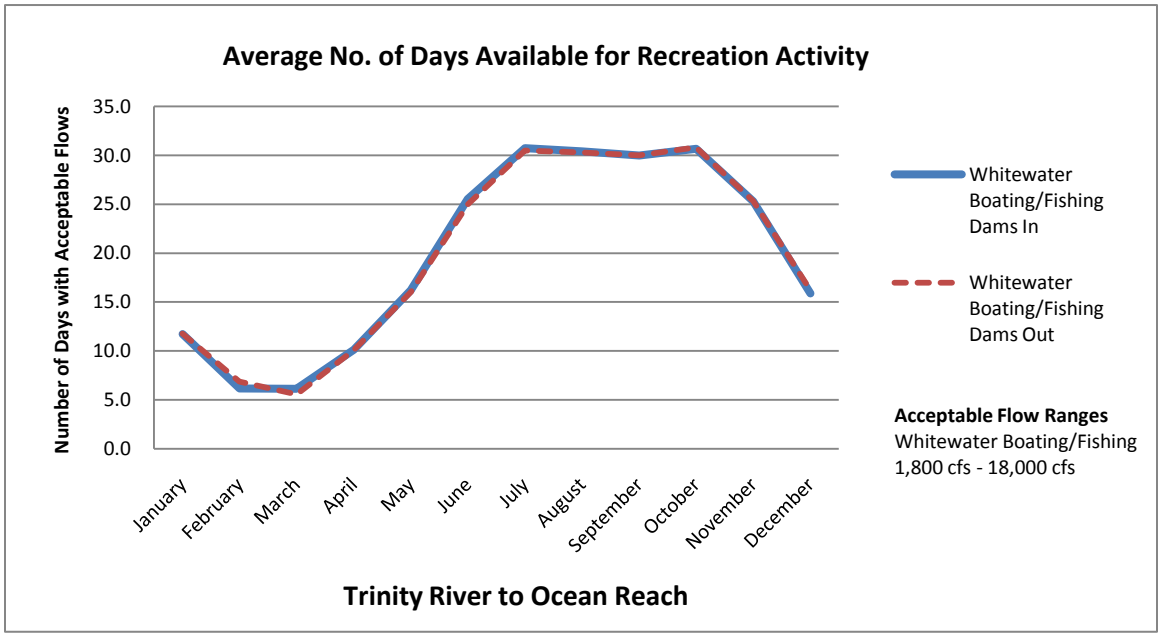

Figure 3.20-11. Comparison of Available Recreation Flows - Trinity River to Ocean Reach

Dam removal could increase the number of days with acceptable flows for whitewater boating in the J.C. Boyle Reach. For the J. C. Boyle Bypass Reach, for whitewater boating flows there would be a substantial increase in the availability of whitewater boating flows within the acceptable flow range, particularly during the May through July time period. Based on the modeling results, under the dams out scenario, there would be a shift from the availability of acceptable fishing flows during July/August time period to March through May time period (see Figure 3.20-5 and Appendix R for full data). For the Copco 2 Bypass Reach there would be a substantial increase in whitewater boating opportunities during the July through September time period (see Figure 3.20-7 and Appendix R for full data) and a slight reduction in length of time for Copco 2 for fishing, primarily a reduction during May time period in the availability of acceptable flows. **Therefore, the impacts on whitewater boating in the J.C. Boyle and Copco 2 Bypass Reaches would be less than significant. In regards to, fishing opportunities in these reaches, the impacts would be less than significant.**

Dam removal could decrease the number of days with acceptable flows for whitewater boating in the Hell's Corner Reach. For the Hell's Corner Reach (see Figure 3.20-6), there would be loss of acceptable flows for whitewater boating opportunities as compared to existing conditions, particularly during August (a reduction of about 88 percent) and September (a reduction of about 76 percent) (see Appendix R). In addition, there would no longer be predictable flows in terms of known timing for flow releases as under the existing conditions. The known timing of the releases allows the commercial outfitters to provide whitewater boating opportunities on a regular scheduled basis. Currently, the Hell's Corner Reach is the only Class V rapids in the region. The next closest Class V whitewater rafting reach is on the Salmon River (access via Nordheimer Campground in the Six Rivers National Forest) approximately 80 miles from Hell's Corner Reach. Whitewater rafters can boat on the Hell's Corner Reach from April through October due to hydroelectric peaking power and flows historically generated by J.C. Boyle Powerhouse to meet high power demand periods. In terms of fishing opportunities, there would be a reduction in the availability of acceptable flows during April; however, overall, the impacts would be minor. **Impacts on whitewater boating opportunities in the Hell's Corner Reach would be significant and unmitigable**. **Impacts on fishing would be less than significant.**

Dam removal could result in increased fisheries populations and abundance, which would improve recreational fishing along the river. As discussed in Section 3.3, Aquatic Resources, removal of the dams would improve habitat conditions for anadromous fish species and is expected to result in increased populations of these species. The increased fisheries populations and abundance would beneficially affect recreational fishing opportunities. More specifically, the increased abundance would allow for enhanced fishing opportunities and could decrease the number of closures of entire fishing seasons over the long-term. **These effects on recreation-based fisheries would be long-term and beneficial.**

Implementation of Mitigation Measure REC-1could permanently reduce recreational opportunities in the Klamath Basin. As described below in section 3.20.4.4, Mitigation Measure REC-1 involves the development of a plan to develop new recreational facilities and river access points along the newly formed river channel between J.C. Boyle Reservoir and Iron Gate Dam following dam removal. However, replacement of recreation facilities would not be at a 1:1 ratio and would require the creation of new gravel roads for construction vehicle access and visitor access to the new recreation sites. While there would be a permanent loss of some recreation areas in the vicinity of the existing reservoirs, the combination of the implementation of REC-1 and the presence of regional recreation areas and opportunities (Table 3.20-4) would compensate for the loss of recreation areas at the subject reservoirs. **The impact from implementing Mitigation Measure REC-1, permanently reducing recreational opportunities in the Klamath Basin, would be less than significant.**

Wild and Scenic River Assessment

The following section provides an assessment of the effects of full facilities removal on each of the four resources specified in the WSR Act Section 7(a) (fish, wildlife, scenery, and recreation river values). The following evaluation criteria were used to assess the effects of the proposed project as compared with conditions present at the time of WSR designation.

Scenic Evaluation

Dam removal could result in changes to water flow character (river flows and accompanying river width, depth, and channel inundation or exposure) compared with conditions present when the Oregon component was designated as a National WSR. Short-term effects would result in a period of increased flows during the time of reservoir drawdown. The changed character of the river width would include areas of exposed substrate where water elevations recede; however, these areas would be outside of the WSR-designated areas. As modeled by the DOI (see Section 3.6, Flood Hydrology), dam removal would not substantially alter existing water flow character. River width and depth are defined by the geology of the region and the surrounding bedrock. As discussed in Section 3.11, Geology, Soils, and Geologic Hazards, river elevation and form downstream from the Four Facilities are primarily controlled by large boulders and bedrock, and only limited adjustment is possible. As described in Section 3.20.3.5, above, the degree of visibility of these scenic quality effects is dependent on viewer location. Views from on-river, in-river, or riverside viewpoints are most likely to display changes to these scenic quality indicators, while views from river canyon roadways and communities are less likely to find these scenic quality changes to be as noticeable or substantial. In the area where reservoirs currently exist, which are currently outside of the WSR-designated areas, but adjacent to the Oregon WSR component, the water elevations would recede and form a narrower channel, changing the conditions from a reservoir-based setting to a free-flowing riverine setting. **Therefore, for these reaches, the long-term scenic quality impacts would be positive due to the reestablishment of free-flowing water conditions, and would result in characteristics that may beneficially affect the potential of these reaches for WSR eligibility.**

Dam removal could result in changes to water flow character (river flows and accompanying river width, depth, and channel inundation or exposure) compared with conditions present when the California component was designated as a National WSR. Downstream, in the California WSR component, as discussed in Section 3.11, Geology, Soils, and Geologic Hazards, any substantial adjustment in river elevations or geomorphology would have already occurred in previous floods and no substantial changes to river morphology would occur following removal of the Four Facilities. Further, modeling conducted by DOI indicates that no long-term impacts would occur with regard to sediment deposition in pools, eddies, slack water, or beaches, and short-term effects would be limited to the area immediately below Iron Gate Dam. **Long-term scenic quality impacts would therefore be positive for the California WSR component.**

Dam removal could result in changes to water appearance (clarity, turbidity, depth of view, color, and prominence of algae) compared with conditions present when the California and Oregon components were designated as National WSRs. As discussed in Section 3.2, Water Quality, removal of the PacifiCorp facilities would eliminate the major sources of water quality problems associated with the dams. Removal of the dams would enhance downstream water appearance for the Oregon and California WSR scenery through its benefits of superior mixing and oxygenation of waters upstream from the WSR, renewal of streambeds through more frequent, high flow flushing events, and reversal of suspected nutrient increases within J.C. Boyle, Copco 1, and Iron Gate Reservoirs. Section 3.2, Water Quality, provides a detailed discussion of improvements to water quality, including reduced floating algae, and increased water clarity. Although removal of the dams would likely result in short-term increases in turbidity and decreased water clarity due to high suspended sediment concentrations during reservoir releases, particularly in the Oregon WSR component, long-term impacts would result in improved water appearance.

As discussed in Section 3.3, Aquatic Resources, spawning gravels released downstream from within the retired reservoirs would restore some natural sediment processes and contribute to scour of attached downstream algae. The deposited sand and gravel on the downstream reaches would be a less favorable habitat for the algae because of greater particle mobility during high-flow events. This would result in positive long-term impacts on scenic water appearance (improved clarity and algae reduction) within the river between Iron Gate Dam and the Shasta River confluence, and would likely have similar but reduced downstream benefits.

At the time of the Oregon WSR designation, the water appearance during summer base flow conditions was of slow-moving waters with large amounts of visible algae-covered rocks, and during peaking events the water appearance was altered to brown and murky colors with large quantities of algal foam. Information about scenery water appearance condition at the time of California WSR designation is lacking; however, it is likely that the trend of increasing habitat for attached algae with its associated water coloration, cloudiness, and limitations on depth of view was already underway at the time of WSR designation (Van De Water et al. 2006). Removal of the dams would restore natural

sediment movement in the streambed and would reduce opportunities for algae attachment, to a degree not possible in 1981 and 1994 due to the presence of the Four Facilities. **Thus, while there would be short-term negative water clarity impacts on scenic quality due to turbidity and silt which could be exposed on river banks, long-term effects to scenic quality would be beneficial for both the California and Oregon WSR components.**

Dam removal could result in changes in opportunities for fish and wildlife viewing compared with conditions present when the California and Oregon components were designated as National WSRs. As discussed in Section 3.3, Aquatic Resources, removal of the Four Facilities would increase the abundance of large anadromous fish in the Klamath River. The potential restoration of the anadromous fish populations would largely be the result of the increase of anadromous fish habitat within the Upper Klamath Basin, along with major water quality improvements within the Klamath WSR downstream of the Four Facilities. The increased population of fish species would improve scenic fish viewing attractions in both the California and Oregon components of the Klamath WSR. Increased fish viewing would be most prominent during fish migration, spawning, or holding periods, when the fish concentrate at particular reaches, pools, riffles, and falls. **Fish and wildlife viewing impacts to scenic quality would be long-term and beneficial as compared to the conditions at the time of the 1981 and 1994 designations for the Oregon and California WSR components.**

Dam removal could result in changes in opportunities for river-dependent wildlife viewing compared with conditions present when the California and Oregon components were designated as National WSRs. Specific effects on river-dependent wildlife populations and scenic viewing opportunities are unknown. As discussed in Section 3.5, Terrestrial Resources, riparian habitat within the Oregon WSR component and potentially beyond, in the Iron Gate Dam to Shasta River segment of the California WSR, would be improved by removal of the dams, and proportional increases in wildlife presence, increase in abundance of anadromous fish in the River and scenic wildlife viewing would be expected. **Therefore, impacts on river-dependent wildlife populations and scenic viewing opportunities would be long-term and beneficial as compared to the conditions at the time of the 1981 and 1994 designations.**

Dam removal could result in changes to riparian vegetation compared with conditions present when the Oregon Klamath River component was designated as National WSRs. As discussed in Section 3.5, Terrestrial Resources, removal of the Four Facilities would result in alteration of the reservoirs and associated shoreline vegetation, with reduced water elevations and more riverine character, with increases in riparian vegetation in the areas where the existing reservoir substrates would convert and be revegetated over time. **This would therefore result in long-term, beneficial impacts on riparian vegetation aspects of scenic quality within the areas immediately upstream and downstream of the Oregon WSR component as compared to conditions at the time of the 1994 designation.**

Dam removal could result in changes to riparian vegetation compared with conditions present when the California Klamath River component was designated as National WSRs. Removal of the Four Facilities would result in a more natural riparian vegetative community immediately downstream of Iron Gate Dam due to sediment deposition and scour and gravel transport. Improved riparian vegetation would increase the presence and scenic variety of the vegetation within the WSR. **This would likely increase overall scenic riparian vegetation aspects of scenic quality over conditions present at the California WSR's 1981 date of designation and result in long-term beneficial effects.**

Dam removal could result in changes to the natural appearing landscape character as compared with conditions present when the Oregon Klamath River component was designated as National WSRs. As discussed in Section 3.19, Scenic Quality, removal of the Four Facilities would result in a more natural setting and character in the areas immediately upstream and downstream of the Oregon WSR component of the Klamath River. The visual setting of the area would also change substantially from views of lakes and PacifiCorp facilities to that of a winding riverine system. **The Four Facilities were present at the time of the 1994 WSR designation of the Oregon component; therefore, removal of the Four Facilities would restore the WSR segments to a more natural flow regime and landscape character and would result in long-term beneficial scenic quality effects.**

Dam removal could result in changes to the natural appearing landscape character as compared with conditions present when the California Klamath River component was designated as National WSRs. The California WSR component is downstream of the Four Facilities; therefore, removal of the dam and associated facilities would not result in any changes to the overall landscape character in this segment of the river. However, as discussed in Section 3.2, Water Quality, water clarity in the WSR component is expected to improve, as is the quality of the riparian vegetation. **These improvements would result in a more natural flow regime and landscape character for the WSR segments and result in a long term positive scenic quality effect.**

Recreation Evaluation

Dam removal could improve opportunities for whitewater boating compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. Whitewater boating opportunities relating to river flow following removal of the Four Facilities would likely be similar to conditions in 1981 for the California WSR component. As discussed in the impact analyses above (see Table 3.20-16), for the Oregon WSR component and the Hell's Corner Reach, the number of days acceptable for whitewater boating would decrease by approximately 57 percent following removal of the dams. For the California WSR component, downstream of Iron Gate Dam, following removal of the dams, the number of days available for whitewater boating would be very similar to the number of days currently available. **Therefore, long-term whitewater boating impacts due to changes in flow would be negative for the Oregon WSR component. No impacts to whitewater boating opportunities due to flow would occur for the California WSR component. Removal of the dams would also result in long-term improvements to water quality conditions over existing**

conditions and the 1981 and 1994 conditions. With improved water quality, the whitewater boating recreation experience would improve in both the Oregon and California WSR components. Therefore, long-term whitewater boating impacts due to improved water quality would be beneficial for both the California and Oregon WSR components.

Dam removal could increase opportunities for recreational fishing compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. As discussed in the impact analyses above, removal of the Four Facilities would not affect water flow such that days with acceptable flows for recreational fishing would substantially increase. However, as described in Section 3.3, Aquatic Resources, the geographic extent of the Klamath River fish habitat would be substantially expanded compared to 1981 and 1994 conditions. It is also expected that and water quality conditions would improve, thereby reducing fish disease. Increased fish populations would likely result in fewer catch and keep fishing restrictions. **Thus, recreational fishing impacts would be long-term and beneficial for both the California and Oregon WSR components.**

Dam removal could result in changes to opportunities for other recreational activities (water play, swimming, camping) compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. Removal of the Four Facilities would result in a long-term decrease of lake and reservoir-based recreational activities associated with the Klamath River in the area immediately upstream and downstream of the Oregon WSR component as compared to conditions at the time of the 1994 designation. Activities that would be most affected are water-contact-based activities, reservoir-based fishing, and flatwater boating. Dam removal would also result in removal of camping and day use facilities that would no longer be directly adjacent to the water's edge. Short-term, negative impacts would occur as a result of the construction activities and staging areas and likely restricted access and use of recreation facilities and opportunities during the period and in the areas where dam removal occurred. **Development of new recreational facilities and river access areas as described in Mitigation Measure REC-1 would reduce long-term negative impacts on reservoir-based recreational activities in these areas to a less than significant level.**

For the California WSR component, dam removal would not affect recreational activities access downstream of the dams. Thus, dam removal would result in no long-term or short-term impacts on recreational activities in these areas as compared to the 1981 conditions.

Dam removal could improve the recreational setting (water-quality related aesthetics, odors, tastes, contacts, and public health and safety aspects) compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. Although there would be short-term, negative impacts on water quality due to the increased sediment load in the river during initial drawdown activities, particularly in the Oregon WSR component, as discussed in Section 3.2, Water Quality,

following completion of reservoir drawdown, dam removal would improve water quality conditions as compared with conditions present at the time of the 1981 and 1994 designations. There could be short-term, negative impacts (lasting less than two years) during reservoir drawdown due to the potential for sediment to clog fishing holes, or possibly make the river less navigable, or even less accessible along shorelines temporarily blocked by sediment deposits.

Alternatively, new beaches and riparian areas may become established to increase the variety of shoreline settings. Most of these effects would be temporary and many aspects of the WSR's recreation setting would be considerably improved once the river stabilizes. The improved water quality conditions following completion of drawdown activities would improve the recreational setting overall (i.e., with improved clarity during swimming and fishing and reduced malodors and tastes [Bartholow et al 2005]). With regard to public health, improved water quality would also reduce potential human health risks associated with water-contact-based activities. **Therefore, impacts on the recreational setting would be long-term and beneficial for both the California and Oregon WSR components.**

Fisheries Evaluation

Dam removal could alter stream flow regime compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. Section 3.6, Flood Hydrology, discusses historic flow rates and discharge statistics for each of the reservoirs. The proposed drawdown rates are consistent with the historic discharge rates from the reservoirs and would be adjusted depending on the water year; therefore, flow rates downstream from the dams are not anticipated to increase substantially above historic rates, if at all. As such, conditions during the drawdown period are expected to remain largely unchanged as compared to stream flow regimes at the time of the 1981 and 1994 designations.

Following removal of the Four Facilities, the Klamath River would return to a natural flow regime in the reaches where the reservoirs currently exist. Restoration of the natural flow regime would improve water quality conditions, likely reducing the occurrence of myxozoan parasites (*Ceratomyxa shasta* and *Parvicapsula minibicornis*) that are known to negatively affect salmonids. Removal of the hydroelectric reservoirs would eliminate populations of blue-green algae that produce toxins that can result in acute and chronic effects on fish, including increased mortality, reduced fecundity, reduced feeding, and habitat avoidance. **Stream flow regime impacts would be long-term and beneficial for both the California and Oregon WSR components.**

Dam removal could decrease fall water temperature compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. Removal of the Four Facilities would improve water quality conditions over existing conditions and the 1981 and 1994 conditions. As described in Sections 3.2, Water Quality, and 3.3, Aquatic Resources, following dam removal, the temperature regime downstream of Iron Gate Dam would be more suitable for salmon. As part of its relicensing procedure, PacifiCorp modeled changes in water temperature that could result

following removal of the dams. The modeling results show that from Iron Gate Dam to Clear Creek temperatures in the spring and early summer would be as much as 5°C warmer, but cooler in later summer and fall than under existing conditions. Temperatures currently remain greater than 20°C in dry years with little variability in July and August. Although summer temperatures would likely be more variable following dam removal, the median temperatures would be substantially lower than current conditions. Summer and fall temperatures would therefore be more conducive to salmon rearing, migrating, and spawning than the conditions that were probable at the date of designation (Van de Water et al. 2006). However, as discussed in Section 3.2, Water Quality, in reaches above J.C. Boyle Reservoir and downstream of Clear Creek, there would be little to no change in the existing temperature regime. **Water temperature impacts would therefore be long-term and beneficial for the California WSR component, and there would be no change from existing conditions in the Oregon WSR component.**

Dam removal could improve water quality characteristics (physical, biological, and chemical) compared to conditions present when the California and Oregon Klamath River components were designated as National WSRs. Removal of the Four Facilities would eliminate the major sources of water quality problems in the Upper Klamath Basin and enhance downstream water quality for salmonids. Removal of the dams would also reduce conditions that foster fish disease outbreaks.

As discussed in Section 3.2, Water Quality, following dam removal, long-term dissolved oxygen levels would be anticipated to meet applicable Basin Plan objectives. However, modeling indicates that nitrogen loading downstream of Iron Gate Dam would increase slightly above existing levels due to the release of sediments from the reservoirs, but the removal of a lacustrine environment in the reservoir area would reduce the abundance of algae that form habitat for the intermediate host for at least two salmon pathogens. The improved water quality conditions would reduce fish crowding, which, as discussed in Section 3.3, Aquatic Resources, would result in reduced temperature-induced stress and could allow for spawning to begin earlier in the fall. **Impacts on water quality characteristics would therefore be long-term and beneficial for both the California and Oregon WSR components.**

Dam removal could alter geomorphic conditions, sediment transport regime, and substrate quality compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. As discussed in Section 3.11, Geology, Soils, and Geologic Hazards, and Section 3.3, Aquatic Resources, sediment stored in the subject reservoirs would be released downstream. The released sediment would have short-term, negative effects on aquatic habitat, but following completion of reservoir drawdown, the increased spawning gravel released from upstream could enhance spawning habitat. Restoring natural sediment processes would contribute to scour of attached algae (e.g., *Cladophera* spp.), and deposited sand and gravel would be a less favorable substrate for the algae because of greater particle mobility during high-flow events than the existing armored substrate. A reduction in such algae would lead to reduced habitat for the fish pathogen's alternate host.

Information about habitat conditions at the time of WSR designation is lacking; however, it is likely that trends of river coarsening, increasing habitat for attached algae, and reduced recruitment and maintenance of riparian vegetation were already underway at the time of WSR designation due to PacifiCorp facilities and operations. The Proposed Action would reduce those trends in the long term, and restore natural sediment transport processes, which were no longer in place by 1981 and 1994. Following the initial drawdown period and flushing of reservoir sediment downstream, aquatic habitat conditions would be expected to be improved from conditions in 1981 and 1994 in the long term. **Therefore, impacts on aquatic habitat conditions would be long-term and beneficial for both the California and Oregon WSR components.**

Dam removal could improve conditions for anadromous fish species compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. As discussed in Section 3.3, Aquatic Resources, dam removal would result in beneficial long-term effects on anadromous salmonids. However, sediment released during dam removal could be sufficient to cause substantial smothering of spawning gravels, pool infilling, gill abrasion, and changes to holding and migration patterns in the river reaches immediately below Iron Gate Dam. These impacts would be short term (lasting less than two years), as sediment is expected to be flushed through the river system relatively quickly. In the long term, dam removal would eliminate the source of most of the water quality issues on both the California and Oregon WSR components that are influenced by the presence of the PacifiCorp facilities. In particular, dam removal would reduce late summer and fall heating, summertime dissolved oxygen depletion, in-reservoir nutrient cycling with resultant summer releases of nitrogen downstream. Removal of the Four Facilities would also eliminate a fish barrier and allow fish to spawn in a greater number of areas. Consequently, fish disease outbreaks could be diminished. Removal of the Four Facilities would also result in habitat conditions that more closely resemble natural conditions (e.g., flow and temperature ranges would be more reflective of climatic forces than of water regulation). However, continuation of the operation of the Iron Gate Fish Hatchery would reduce some of the beneficial effects of dam removal by continuing pressures on natural stocks that would improve with dam removal. Even so, Chinook salmon, coho salmon, and steelhead abundance would still be expected to increase over 1981 and 1994 levels in the long term. **Long-term beneficial impacts on conditions for anadromous fish species would result for both the California and Oregon WSRs.**

Dam removal could improve conditions for resident fish species compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. As discussed in Section 3.3, Aquatic Resources, removal of the Four Facilities would improve conditions for native resident fish species by restoring connectivity between the Lower and Upper Klamath River, and by returning a natural flow regime to the reaches where the reservoirs currently exist, thereby improving water quality. Dam removal would also likely result in diminished non-native fish habitat and populations, reducing competition for space and resources with native and resident fish. Because the non-native fish were introduced and occur in other nearby water bodies, their loss would not be considered significant from a biological perspective

and is not included in this effect evaluation. **Therefore these impacts on the conditions for resident fish species would be long-term and beneficial in both the California and Oregon WSR components.**

Dam removal could improve conditions for species traditionally used and culturally important to Indian Tribes compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. As discussed in Section 3.3, Aquatic Resources, removal of the Four Facilities would improve conditions for culturally important fish species (e.g., Chinook salmon, coho salmon, steelhead, and lamprey) by restoring connectivity between the Lower and Upper Klamath River, and by returning a natural flow regime to the reaches where the reservoirs currently exist and downstream of Iron Gate Dam, thereby improving water quality. Dam removal would also likely result in diminished non-native fish habitat and populations, reducing competition for space and resources with native and resident fish. **Impacts on the conditions for species traditionally used and culturally important to Indian Tribes would be long-term and beneficial in both the California and Oregon WSR components.**

Wildlife Evaluation

Dam removal could result in changes to habitat for special status species compared with conditions present when the California and Oregon Klamath River components were designated as National WSRs. Conversion of the reservoirs to free-flowing riverine character in the Oregon WSR component would result in beneficial establishment of riparian vegetation over the long term due to fine sediment released into this section would allow the establishment of such vegetation.

Following dam removal, active restoration would be needed to revegetate the riparian areas along the newly created river channel. Restoration activities would be carried out in accordance with the Reservoir Area Management Plan (DOI 2011c), as described in Section 3.5, Terrestrial Resources. Invasive plant species would be controlled with the use of herbicides such as glyphosate that have low soil mobility and low toxicity to fish and aquatic organisms (DOI 2011c). Additionally, as described in Section 3.5, Terrestrial Resources, active control measures would be required to protect against the colonization of invasive or weedy species on newly exposed areas. A Habitat Restoration Plan and construction specifications would be developed once the Definite Plan is available and would be submitted to the resource agencies for review and approval as part of required permit application packages prior to construction.

Riparian vegetation in the California WSR component downstream of the Iron Gate Dam would also benefit from dam removal, especially in the reach between the Iron Gate Dam and the Shasta River confluence. Special status species that are dependent on riparian habitat, such as the willow flycatcher, northwestern pond turtle, and yellow breasted chat, would benefit greatly from successful riparian habitat recovery from Iron Gate Dam downstream to the Klamath River's confluence with the Shasta River. Downstream from that point, the riparian-dependent wildlife would still benefit from increased diversity and amounts of riparian vegetation, but these benefits might be offset by some potential

short-term impacts as the released sediment moves downstream into areas that are currently in better condition.

In addition to improving riparian habitat, the Proposed Action would result in improvements in fish resources in the long term following dam removal, thus providing increased forage for wildlife species that depend upon fish as a food source. The area currently blocked by dams would provide additional available habitat for anadromous fish. The increase in habitat quality and quantity should allow the number of anadromous fish to increase substantially. Increased numbers of fish would also create greater foraging opportunities for riparian and riverine species such as bald eagle, river otter, osprey and black bear. **Therefore, there would be long-term, beneficial impacts on habitat for special status species in both the California and Oregon WSR components.**

East and West Side Facilities Decommissioning

The decommissioning of the East and West Side Facilities could have adverse effects on recreational resources. Decommissioning of the East and West Side canals and hydropower facilities of the Link River Dam by PacifiCorp as a part of the Klamath Hydroelectric Settlement Agreement (KHSA) will redirect water flows currently diverted at Link River Dam into the two canals, back in to Link River. Following decommissioning of the facilities there will be no change in outflow from Upper Klamath Lake or inflow into Lake Ewauna. **Therefore, there will be no change from existing conditions caused from decommissioning the East and West Side Facilities.**

Keno Facilities Transfer

Transfer of the Keno Facility from PacifiCorp to DOI could affect recreational opportunities. Keno Dam is an unmanned facility which requires minimal operations and maintenance. Recreation facilities owned by PacifiCorp in the vicinity of Keno Impoundment will also be transferred to DOI as described in the KHSA section 7.5. Operation of Keno Dam and of the recreation areas are expected to continue in their current fashion. **The transfer of the facility and recreation lands will result in no changes from existing conditions.**

KBRA

The Klamath Basin Restoration Agreement (KBRA) has several programs that could result in short-term and long-term changes to recreational opportunities in the Klamath Basin. Such changes would be the result of temporary construction activities as well as long-term increases in aquatic habitat and fish populations, improvements to water quality, and improvements to terrestrial resources. Specific KBRA programs potentially affecting recreational opportunities include:

- Phases I and II Fisheries Restoration Plans
- Fisheries Reintroduction and Management Plan
- Wood River Wetland Restoration
- Water Diversion Limitations

- On-Project Plan
- Water Use Retirement Program (WURP)
- Climate Change Assessment and Adaptive Management
- Interim Flow and Lake Level Program

Construction activities associated with the KBRA programs could temporarily restrict access to recreational opportunities. Construction activities including channel construction, fish passage and facilities construction, breaching levees, and fish hauling would likely involve the use of heavy equipment along floodplain and riparian areas and therefore could result in restrictions to public access for recreational activities, such as sightseeing, bank fishing, swimming, and wading. Because restoration activities would occur throughout the entire basin, specific sections of the river could be closed for a period of time throughout implementation of the KBRA programs. However, as described in the Affected Environment section, there are a number of recreational areas offering similar activities and settings throughout the basin. It is likely that for any particular project, there would be an alternative recreational area nearby that could be used during temporary closures. Construction related to KBRA programs could occur in the same location and time as construction actions for the hydroelectric facility removal and affect access to or availability of recreation resources. However, because of the multitude of resources in the region, effects to recreation under both the KBRA and KHSA would be less than significant. **Thus, potential impacts to recreational opportunities are anticipated to be less than significant. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

Construction activities associated with KBRA programs could result in short-term water quality impacts which could affect recreational opportunities. Erosion and sedimentation during construction activities has the potential to temporarily decrease water quality and reduce water visibility for boaters, swimmers, and fisherman. These short-term water quality impacts would be anticipated to occur throughout the basin where construction activities take place. Specific sections of the river could be affected for a period of time throughout implementation of the KBRA programs. However, following implementation and related construction activities for KBRA programs including the Wood River Wetland Restoration, and the Interim Flow and Lake Level Program, WURP, water quality and clarity would be expected to improve. Additionally, as described above, short-term impacts would be offset by the ability of visitors and local recreationalists to use the recreational areas with similar activities and settings throughout the basin. Construction related to KBRA programs could occur in the same location and time as construction actions for the hydroelectric facility removal and affect water quality at recreation resources. However, because of the multitude of resources in the region, effects to recreation under both the KBRA and KHSA would be less than significant. **Potential impacts would be short-term and, with implementation of construction BMPs, are anticipated to result in less than significant water quality related recreational impacts. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

Fire treatment proposed in the Fisheries Restoration Plan could alter the visual setting and result in decreased recreational visitors to the Klamath Basin. As described above for the No Action/No Project Alternative, it is expected that landscape scale prescribed fire treatments would result in a short-term adverse effect of the visual quality of the burned area, which could directly affect the number of recreational visitors to the area. In the short-term, prescribed fire treatments would be less than significant. Prescribed fire treatment actions would not occur in the same location and at the same time as hydroelectric facility removal actions; therefore, potential for any visual quality improvements generated by these prescribed fire treatment actions would not change effects of facility removal. **Impacts are anticipated to be long-term and beneficial because they are expected to return the forests to a more natural condition. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

KBRA actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin. It is expected that correction of fish passage issues throughout the basin would restore fish access to new and historic habitats and result in increased fish populations. KBRA programs such as the Fisheries Reintroduction and Management Plan, and the Wood River Wetland Restoration include actions to restore and create fish habitat and wetlands for endangered fish species. Additionally, projects such as Water Diversion Limitations would increase water availability for fisheries. It is anticipated that these programs and projects would result in increased fish populations and abundance, which would beneficially affect recreational fishing opportunities. More specifically, the increased abundance would allow for increased catch limits and fewer catch and release requirements, as well as decrease the potential of closures of entire fishing seasons as those that occurred on the Klamath River in the recent past. Correction of fish passage issues as a result of the KBRA would support the positive improvements to recreation from increased fish populations due to hydroelectric facility removal. **These changes are anticipated to result in beneficial effects to recreational experiences throughout the Klamath Basin. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

KBRA programs resulting in long-term water quality improvements could increase recreational opportunities throughout the Klamath Basin. KBRA programs including the Fisheries Restoration Plans Phase I and II; Fisheries Reintroduction and Management Plan; Wood River Wetland Restoration; WURP; and, Interim Flow and Lake Level Program would result in long-term benefits to water quality throughout the Klamath Basin. As described in Section 3.2, Aquatics Resources, improvements in water quality would enhance fisheries habitat in the Klamath River and tributaries. Improvement of water quality as a result of KBRA actions would support positive improvements to recreation from improved water quality due to hydroelectric facility removal. **It is anticipated that improvements in fish habitat and abundance would benefit recreational opportunities in Klamath Basin. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

KBRA programs that enhance terrestrial wildlife and plant resources could increase recreational opportunities throughout the Klamath Basin. KBRA programs including Fisheries Restoration Plans Phase I and II; Wood River Wetland Restoration; Water Diversion Limitations; On-Project Plan; WURP; and, Interim Flow and Lake Level Programs would result in long-term benefits to terrestrial species as a result of restored floodplain and riparian vegetation and habitat areas. While short-term construction activities involved in the implementation of some of these programs would result in short-term adverse impacts on terrestrial resources, the long-term effects of habitat restoration would be expected to benefit terrestrial species in the Klamath Basin. KBRA programs like the Wood River Wetland Restoration project are anticipated to increase habitat for waterfowl, water birds, and other species utilizing wetland and open water habitat at Upper Klamath Lake. Improvement of terrestrial wildlife and plant resources as a result of the KBRA would support positive improvements to wildlife viewing due to hydroelectric facility removal. **It is anticipated that improvements and increases in terrestrial wildlife habitat would benefit recreational wildlife viewing and recreational hunting opportunities in the Klamath Basin. Implementation of specific plans and projects described in the KBRA will require future environmental compliance as appropriate.**

Alternative 3: Partial Facilities Removal of Four Dams

Under this alternative, short-term demolition activities and drawdown of reservoirs would still occur; however, demolition would consist only of in-stream facilities and select ancillary facilities; other ancillary facilities associated with the KHP would remain in place. Recreation facilities would be removed with the exception of Topsy Campground, Fall Creek and Jenny Creek Day Use Areas, and the Iron Gate Fish Hatchery Day Use area, as under the Proposed Action and the impact would therefore be the same as described previously. With regard to the WSR setting, impacts would be the same as for the Proposed Action, with the exception of the magnitude of positive impacts of returning the reservoir areas that are adjacent upstream and downstream of the Oregon WSR component to a more natural visual setting. Because some ancillary facilities associated with the KHP would remain in place, positive impacts as compared to the 1994 Oregon WSR designation would be fewer and at a smaller scale than as described for the Proposed Action.

East and West Side Facilities Removal

The decommissioning of the East and West Side Facilities could have adverse effects on recreation. The effects of the East and West Side Facilities removal would be the same as those described for the Proposed Action. **Therefore, the decommissioning activities would have no change from existing conditions on recreation.**

Keno Facilities Transfer

Transfer of the Keno Facility from PacifiCorp to DOI could affect recreational opportunities. Keno Dam is an unmanned facility which requires minimal operations and maintenance. Recreation facilities owned by PacifiCorp in the vicinity of Keno Impoundment will also be transferred to DOI as described in the KHSA section 7.5. Operation of Keno Dam and of the recreation areas are expected to continue in their

current fashion. **The transfer of the Keno Facility and recreation lands will have no change from existing conditions on recreational resources or facilities.**

KBRA

Under this alternative the KBRA would be fully implemented; therefore, impacts on recreation facilities and opportunities would be the same as described for KBRA under the Proposed Action.

Alternative 4: Fish Passage at Four Dams

The Fish Passage at Four Dams Alternative could change existing recreation access and opportunities. Impacts under this alternative would be similar to those described under the No Action/No Project Alternative. Because the dams would remain in place, none of the expected beneficial changes to water quality would occur; therefore, beneficial effects with regard to water-contact-based activities described under the Proposed Action would not occur. The recreational setting (campgrounds, day use areas, and water access areas) would remain as described in the Affected Environment section. **Under the Fish Passage at Four Dams Alternative, existing conditions for recreational fishing within the river and water-contact-based activities at the subject reservoirs would have no change from existing conditions.**

Implementation of the prescriptions provided by the USFWS, DOI, and United States Department of Commerce in the FERC 2007 EIS could change whitewater boating opportunities in the Hell's Corner Reach. There would be a loss of acceptable flows for whitewater boating opportunities in the Hell's Corner Reach as compared to existing conditions. The prescriptions set minimum streamflow requirements for the Peaking Reach downstream of J.C. Boyle Powerhouse. A minimum streamflow of 1,500 cfs must be provided no more than once per week as opposed to existing conditions where acceptable whitewater flows are maintained a majority of the time. In addition, there would no longer be predictable flows in terms of known timing for flow releases as under the existing conditions. **Impacts on whitewater boating opportunities in the Hell's Corner Reach would be significant and unavoidable**.

Fish passage facilities would result in increased fisheries populations and abundance, which could improve recreational fishing along the river. As discussed in Section 3.3, Aquatic Resources, installation of fish passage at the dams would likely beneficially affect anadromous fisheries in the Klamath River, although not to as great a degree as under the Proposed Action. Increased abundance and population of recreational fishery species would likely result in beneficial effects on recreational fishing downstream of Iron Gate Dam. More specifically, the increased abundance would allow for increased catch limits and fewer catch and release requirements, and would decrease the number of potential fishing season closures such as those that occurred on the Klamath River in the recent past. **Impacts with regard to recreational fishing opportunities would be long-term and less than significant.**

Alternative 5: Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate

Dam removal could permanently remove recreational facilities in the area of Copco 1 and Iron Gate Reservoirs. Under this alternative, Copco 1 and Iron Gate Dams would be removed, but Copco 2 Dam and J.C. Boyle Dam would remain in place. The impacts would be similar to those described for the Proposed Action for the areas surrounding the Copco 1 and Iron Gate Reservoirs; recreation facilities at these sites would be removed. **Impacts on recreational facilities at Copco 1 and Iron Gate reservoirs would be considered permanent and significant; however, implementation of Mitigation Measure REC-1 would reduce these impacts in the long-term to less than significant.**

Dam removal could permanently decrease the availability of reservoir/lake-based recreational opportunities. Reservoir-based recreational opportunities (e.g., swimming, bathing, wading, and reservoir-fishing) would be lost at Iron Gate and Copco 1 Reservoirs, although visitors would still be able to travel to J.C. Boyle Reservoir for these activities; thus, adverse impacts would be fewer and smaller in scale than those described for the Proposed Action. **Impacts on the regional availability of reservoir-based recreational opportunities would be less than significant**.

Dam removal could change whitewater boating opportunities in the Klamath River. With regard to changes in whitewater boating opportunities, the existing Copco 1 and Iron Gate Reservoirs would be converted to free-flowing riverine reaches over the long term, and depending on the river channel and access, could provide additional opportunities for whitewater boating in these reaches (Appendix R). **Impacts on whitewater boating opportunities would be less than significant.**

Loss of peaking flows in the J.C. Boyle Peaking Reach could affect whitewater boating opportunities in the Hell's Corner Reach. The loss of peaking flows in the Hell's Corner Reach would result in the river returning to natural flow conditions, with no ability to re-regulate peaking flows. Thus, there would be diminished whitewater boating opportunities in this reach. **Impacts on whitewater boating opportunities in the Hell's Corner Reach would be significant and unmitigable**.

Changes in water quality associated with dam removal could positively affect water-contact-based recreational opportunities. As discussed in Section 3.2, Water Quality, improvements in water quality are expected; however, these improvements would be less than as described under the Proposed Action. Therefore, beneficial effects on water-contact-based recreation would occur as described for the Proposed Action, in the river channel below J.C. Boyle and Copco 2 Dams. Beneficial effects would not be anticipated to occur in the J.C. Boyle Reservoir (as described above, there are little to no recreational facilities at Copco 2 Reservoir). Also, as discussed in Section 3.3, Aquatic Resources, populations and abundance of anadromous fish would increase under this alternative (although not to the same degree described for the Proposed Action); therefore, beneficial effects on recreational fishing would be similar, but less than those described for the Proposed Action. **Because existing conditions for water-contact-**

based recreational activities are considered adverse due to water quality, improved water quality conditions would result in long-term beneficial effects.

3.20.4.4 Mitigation Measures

Mitigation Measure by Consequences Summary

REC-1 – At least one year before starting dam removal activities, the DRE will prepare a plan to develop new recreational facilities and river access points along the newly formed river channel between J.C. Boyle Reservoir and Iron Gate Dam. The plan will be developed in consultation with appropriate state and federal agencies (e.g., BLM and CDFG) and stakeholder groups, and will include an implementation schedule for construction of recreational facilities and river access areas.

Effectiveness of Mitigation in Reducing Consequences

Implementation of Mitigation Measure REC-1 will ensure that access to the Klamath River at the location of the removed reservoirs will remain available following dam removal. The potential for fewer recreational opportunities than currently exist would be less than significant (See section 3.20.4.3)

Agency Responsible for Mitigation Implementation

The DRE would be responsible for implementing mitigation measure REC-1.

Remaining Significant Impacts

Following implementation of Mitigation Measure REC-1, no significant adverse impacts associated with Recreation are anticipated.

Mitigation Measures Associated with Other Resource Areas

Mitigation Measures AR-1, 2, 5-7 could interfere with river based recreation downstream of Iron Gate Dam. These mitigation measures involve trap and haul of fish and mollusks to protect them from the reservoir drawdown and dam deconstruction activities. These mitigation measures would include trapping activities in the Klamath River that could interfere with river based recreation between February and April 2020. However, as described in Section 3.20.3.1, Regional Opportunities, a number of other river recreation areas are present within and adjacent to the Klamath Basin and provide similar opportunities for recreational activity. **Temporary impacts on recreational access from Mitigation Measures AR-1, 2, 5-7 would be less than significant.**

Mitigation Measure TR-1 could interfere with reservoir based recreation in Iron Gate Dam. The bridge crosses Jenny Creek at the point it enters Iron Gate Reservoir. Relocation of the Jenny Creek Bridge and culverts would occur before the other construction phases of dam removal. In comparison to the dam removal, equipment and time required for this construction would be minimal, but it could affect reservoir based recreation near the bridge. However, as described in Section 3.20.3.1, Regional Opportunities, a number of other reservoir and lake recreation areas are present within and adjacent to the Klamath Basin and provide similar opportunities for recreational activity. **Impacts on recreational access from Mitigation Measure TR-1 would be less than significant.**

3.20.4.5 Summary of Beneficial Effects

Table 3.20-17 summarizes the beneficial effects of the Proposed Action and alternatives.

Table 3.20-17. Beneficial Effects of the Proposed Action and Alternatives

Effect	Alternatives				
	1	2	3	4	5
Continued existence of the reservoirs could change existing recreation access	NCFEC	-	-	NCFEC	-
Construction activities associated with ongoing programs could temporarily restrict access to recreational opportunities	LTS				
Construction activities associated with ongoing programs could result in short-term water quality impacts which could affect recreational opportunities.	LTS				
Ongoing actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin.	B				
Construction activities could temporarily restrict recreational access on and in the vicinity of the reservoirs	NCFEC	LTS	LTS	NCFEC	LTS
Construction activities, such as demolition, would generate temporary impacts (i.e., increased noise and dust) and could decrease the quality of recreational experiences in the vicinity of the reservoirs.	-	LTS	LTS	-	LTS
Reservoir removal could permanently decrease the availability of reservoir/lake-based recreational opportunities.	NCFEC	LTS	LTS	NCFEC	LTS
Removal of recreation facilities could limit access to recreational opportunities along and within the newly formed river channel.	-	S	S	-	S
Changes in flow and water quality following dam removal could impact developed recreational facilities upstream and downstream of the reservoirs.	-	LTS	LTS	-	LTS

Table 3.20-17. Beneficial Effects of the Proposed Action and Alternatives

Effect	Alternatives				
	1	2	3	4	5
Downstream sediment release during reservoir drawdown could decrease the quality of water-contact-	-	LTS	LTS	-	LTS
Removal of impoundments improves water quality and could impact water-contact-based recreational opportunities.	NCFEC	B	B	NCFEC	B
Changes to the floodplain or river channel and removal of recreation facilities as a result of dam removal could affect access to whitewater boating opportunities.	-	NCFEC (downstream of Iron Gate); LTS (Hydroelectric Reach)	NCFEC (downstream of Iron Gate); LTS (Hydroelectric Reach)	-	NCFEC (downstream of Iron Gate); LTS (Hydroelectric Reach)
Changes in flows following dam removal could increase the number of days with acceptable flows for various recreational activities in the Klamath River.	-	LTS	LTS	-	LTS
Changes in flows could increase the number of days with acceptable flows for whitewater boating and fishing in the J.C. Boule and Copco 2 Bypass Reaches.	-	LTS	LTS	LTS	LTS
Changes in flows could decrease the number of days with acceptable flows for whitewater boating and fishing in the Hells Corner Reach.	-	S (whitewater boating) LTS (Fishing)	S (whitewater boating) LTS (Fishing)	S (whitewater boating)	S (whitewater boating) LTS (Fishing)
Improved habitat for anadromous fish species following dam removal could affect recreational fishing opportunities in the long-term.	-	B	B	-	B
Implementation of Mitigation Measure REC-1 could permanently reduce recreational opportunities in the Klamath Basin.	-	LTS	LTS	-	LTS
Keno Transfer					
Transfer of the Keno Facility	-	NCFEC	NCFEC	-	-
East and West Side Facilities					
The decommissioning of the East and West Side Facilities could have adverse effects on recreational resources.	-	NCFEC	NCFEC	-	-

Table 3.20-17. Beneficial Effects of the Proposed Action and Alternatives

Effect	Alternatives				
	1	2	3	4	5
KBRA					
Construction activities associated with the KBRA could temporarily restrict recreational access.	-	LTS	LTS	-	-
Construction activities associated with KBRA programs could result in short-term water quality impacts which could affect recreational opportunities.	-	LTS	LTS	-	-
Fire treatment proposed in the Fisheries Restoration Plan could alter the visual setting and result in decreased recreational visitors to the Klamath Basin.	-	LTS (short-term) B (long-term)	LTS (short-term) B (long-term)	-	-
KBRA actions correcting fish passage issues, reintroducing and monitoring fish species, and restoring aquatic habitat could increase recreational fishing and wildlife viewing opportunities in the basin.	-	B	B	-	-
KBRA programs resulting in long-term water quality improvements could increase recreational opportunities throughout the Klamath Basin.	-	B	B	-	-
KBRA programs that enhance terrestrial wildlife and plant resources could increase recreational opportunities throughout the Klamath Basin.	-	B	B	-	-

Key:
Alternative 1 = No Action/No Project Alternative
Alternative 2 = Full Facilities Removal of Four Dams (Proposed Action)
Alternative 3 = Partial Facilities Removal of Four Dams Alternative
Alternative 4 = Fish Passage at Four Dams Alternative
Alternative 5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative
B = Beneficial
LTS = Less than significant
NCFEC = No change from existing conditions
S = Significant

3.20.5 References

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